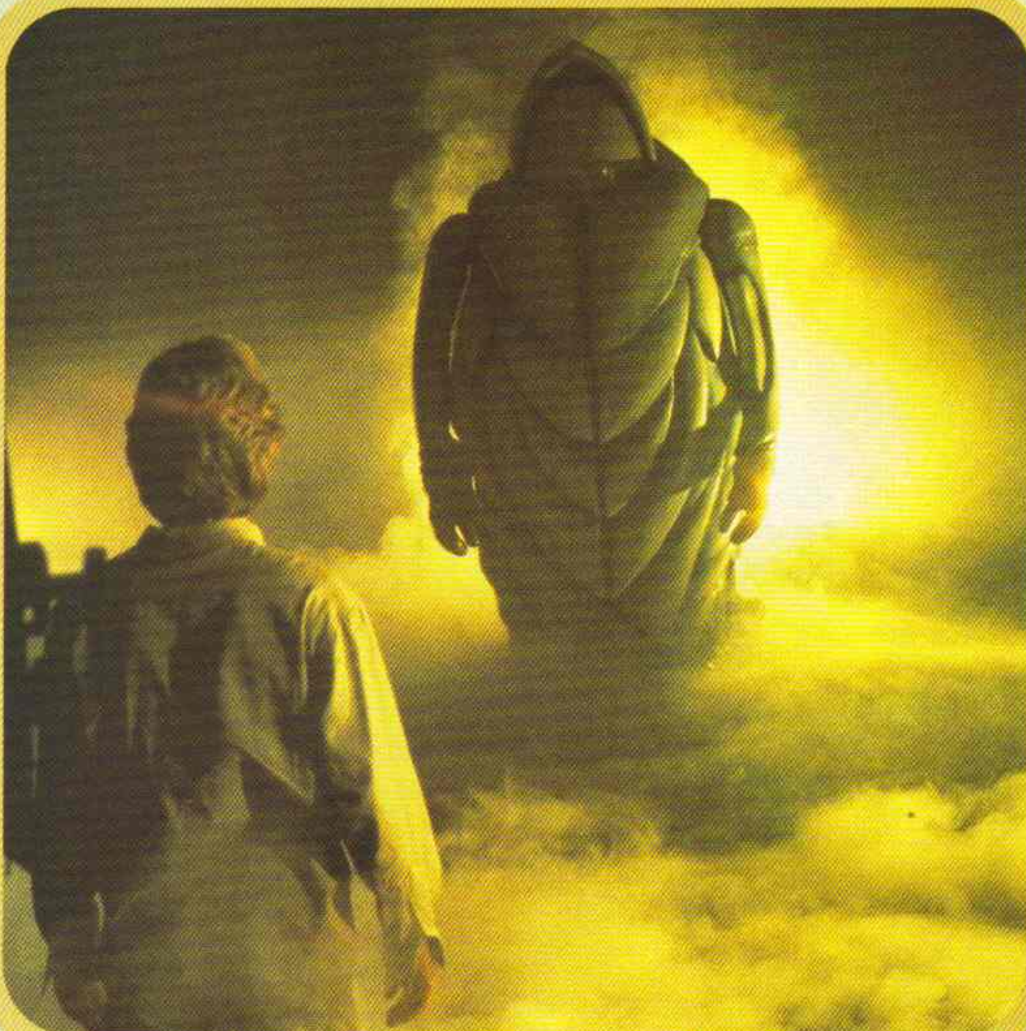
A Science Magazine from CTW, the Creators of Sesame Street. October 1980 95¢ 14192

3-2-1 CONTACT™

Close Encounters
A UFO Movie Returns With a New Look





EEK!

Do you believe in large, green turtle people from outer space? Of course not!

Things like that only happen in **science fiction** stories. "Sci-fi" books and movies start with science. They use it to tell wonderful stories. In some ways science fiction sounds unbelievable. At the same time, much of it could happen. That's what makes it so much fun.

Jules Verne wrote sci-fi stories over 100 years ago. People loved his books about atomic submarines and rocket trips to the moon. They didn't realize that many of the things in his stories would someday come true.

You can find out about another sci-fi writer on page 15. After you do, turn to page 18. That's where our sci-fi puzzle section begins.

3-2-1 Contact is a publication of the Children's Television Workshop, published ten times during the year, monthly except for January and August.

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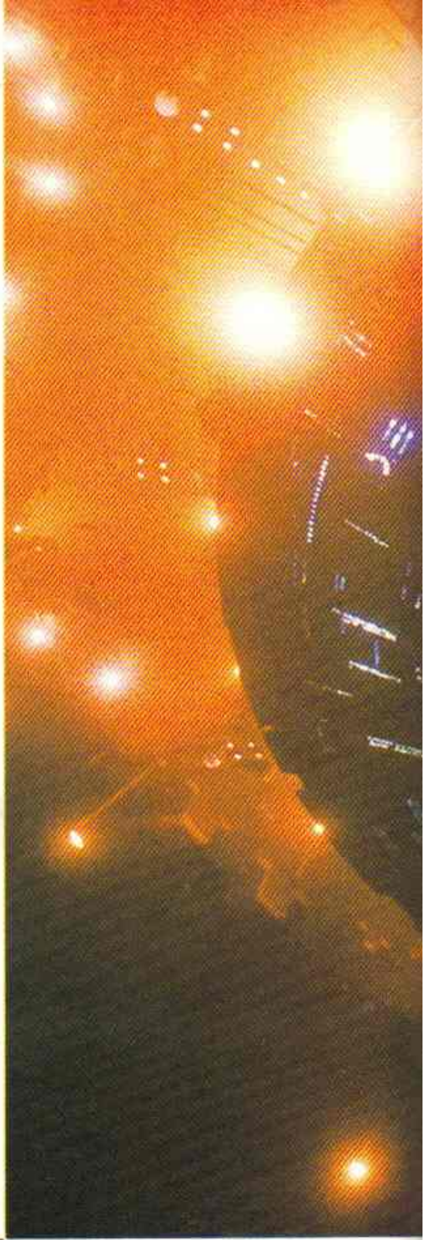
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3-2-1 CONTACT

Featuring This Month

Plus Our Regular Departments





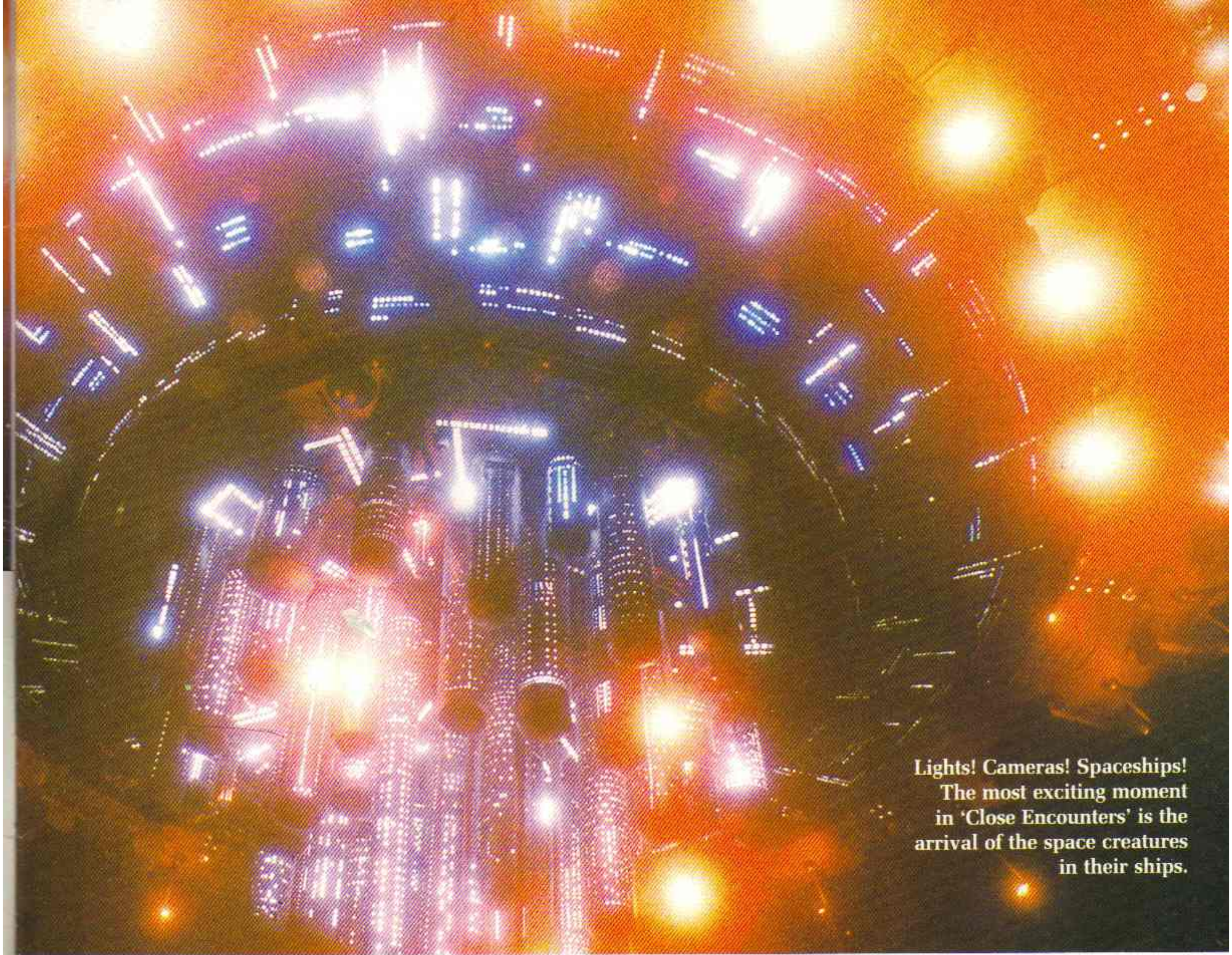
CLOSER



EN

A HIT SCI-

Above Left: Outside the glowing door, a close encounter is waiting for five-year-old Barry Guiler. **Left:** The shape that has been driving Roy Neary crazy shows up—on his TV screen! Next stop, Devil's Tower, Wyoming.



Lights! Cameras! Spaceships! The most exciting moment in 'Close Encounters' is the arrival of the space creatures in their ships.

COUNTERS

FI MOVIE MAKES A COMEBACK

by Ken Wilson

When *Close Encounters of the Third Kind* appeared three years ago, it became one of the most popular movies of all time. Now this sci-fi spectacular is back—and this time something is different. The film is a "special edition." There are 20 minutes of new scenes and effects.

"When *Close Encounters* was made, we didn't have as much money as we would have liked," explains the film's director, Steven Spielberg. "There was much more we wanted to put into the movie, but we couldn't. Now we've been able to tell the whole story."

Messages from Space

Close Encounters tells the story of Roy Neary. Roy sees beautiful lights in the sky one night. He is convinced he has seen a group of UFOs—unidentified flying objects. He even starts to believe he is getting "messages" from the UFOs. Soon, Neary finds he has to go to a mysterious ➜



Above: The aliens' ship has just landed, and Barry (bottom, left) comes out. Everyone waits to see what else is inside.

"meeting" at Devil's Tower Park in Wyoming.

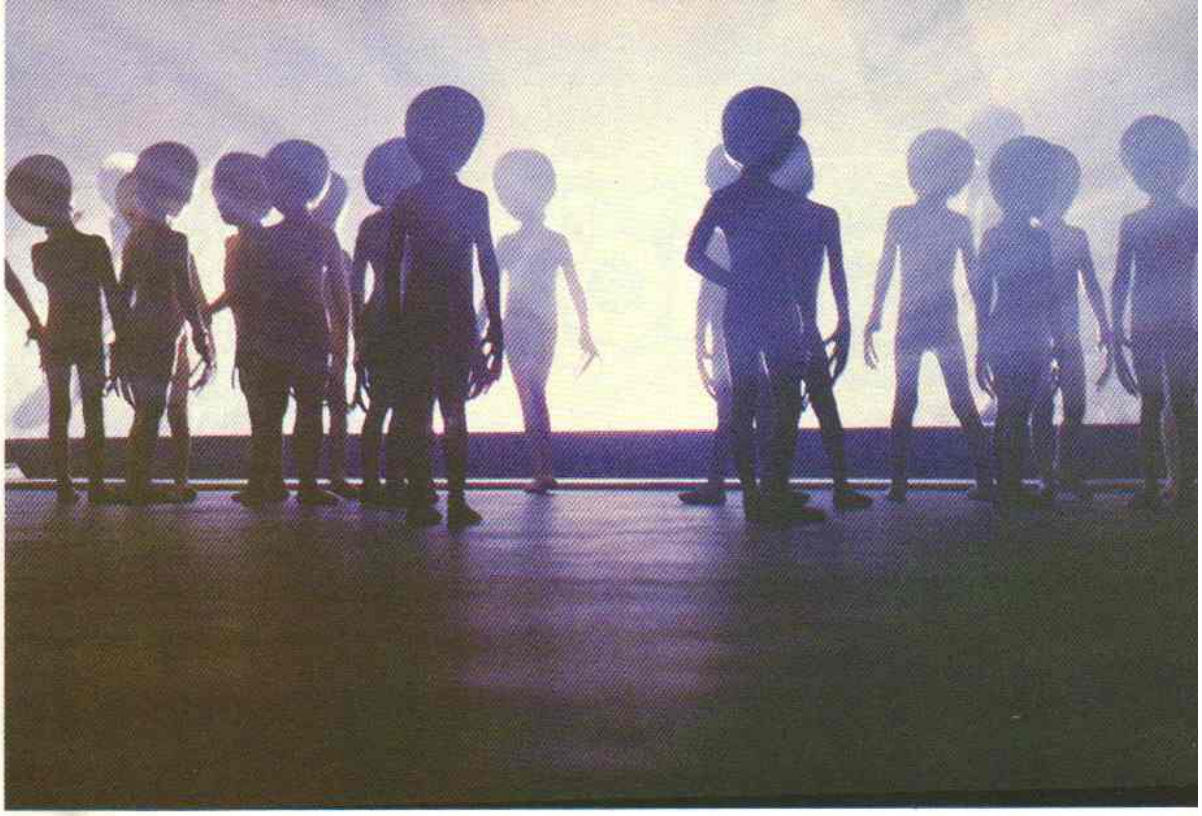
The final scene in the first version of *Close Encounters* was one of the most exciting ever put on film. As Neary watches, huge spaceships gather over Devil's Tower. Colored lights flash and loud musical notes echo through the air. Finally, Roy gets a chance to move towards the spaceship and a meeting with the aliens inside. The film ended just as he prepared to go in.

"That's one of the main reasons to see the film again," says Steven Spielberg. "The new footage takes Neary one step further." Movie audiences will get, he says, "the ultimate experience"—a peek inside the spaceship.

What's an Encounter?

Close Encounters gets its name from three ways a person can have a UFO "experience." *Seeing* a UFO is an encounter of the *first* kind. If someone claims to have actual *proof* of a UFO visit, that is an encounter of the *second* kind. And if someone claims actual *contact* was made with a space creature, that would be a close encounter of the *third* kind. Many people claim they have

Right: A quick look at the aliens of 'Close Encounters.' These space visitors were played by public school kids.



had close encounters. But no one can prove it.

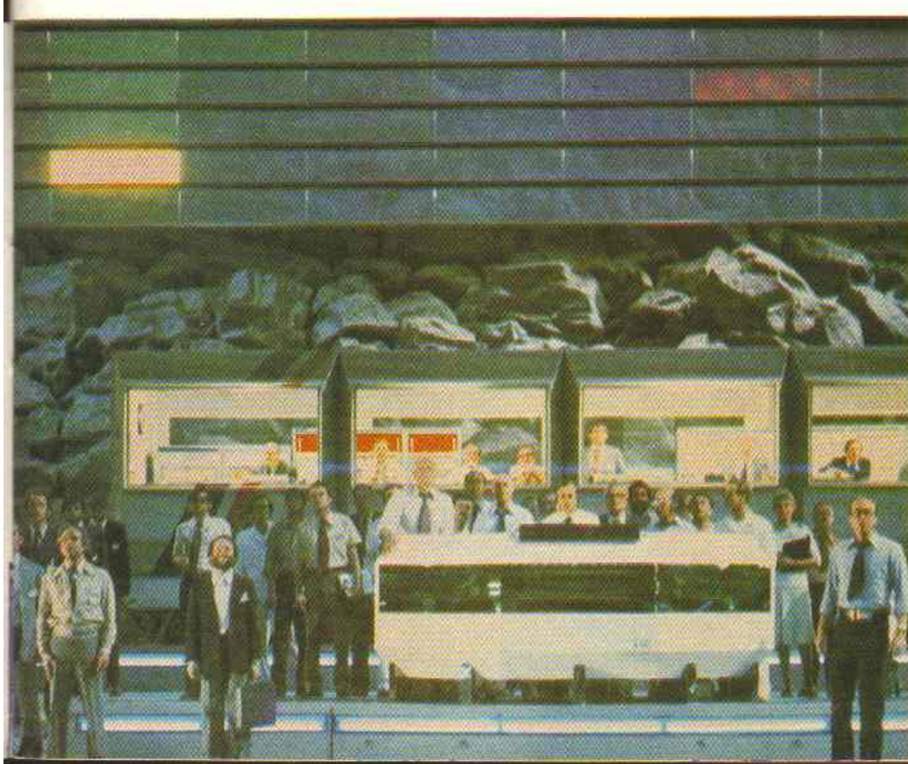
Director Spielberg says he's always been interested in UFO encounters. When he was 15, he made a home movie about UFOs. It was almost two hours long!

A few years ago, Spielberg became famous as the director of the super-hit movie, *Jaws*. But, he says, *Close Encounters* is his favorite film. Maybe it's because he thinks the story isn't impossible. "I've always believed in the existence of life on other planets," he says. "And I firmly believe in UFO encounters."

Many people don't believe UFOs exist at all. What do you think? You can find out more about UFOs by turning *to page 34.*

Below left: How do aliens and earthlings communicate? In this scene, they do it with flashing colors and loud musical notes.

Below right: In the new part of the film, Roy Neary (played by Richard Dreyfuss) actually gets inside the aliens' ship.

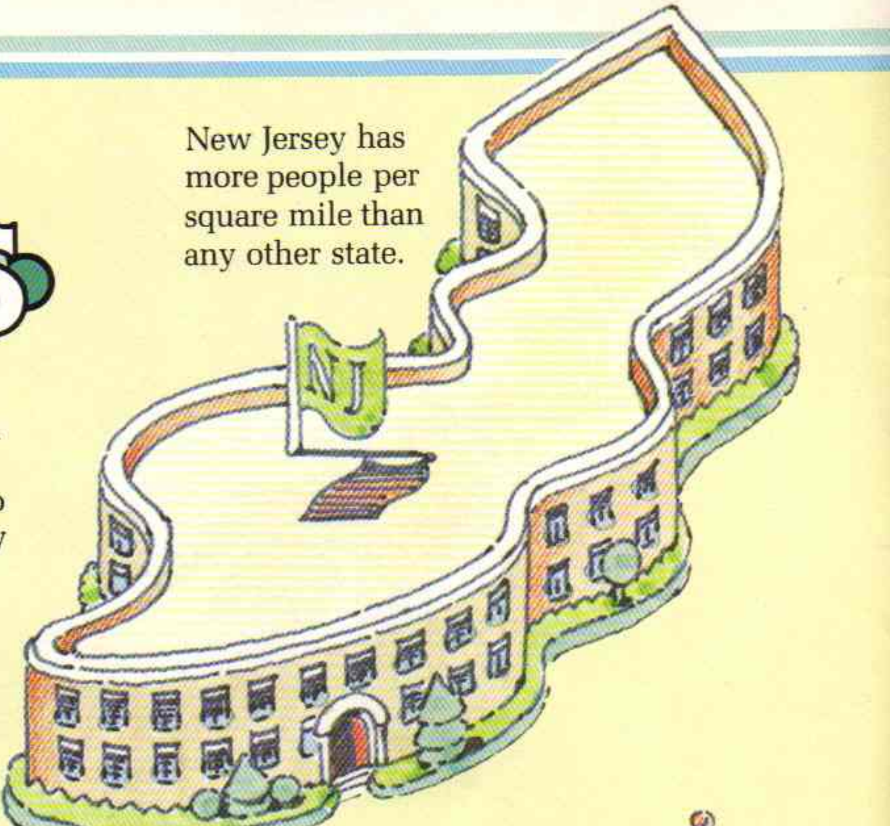


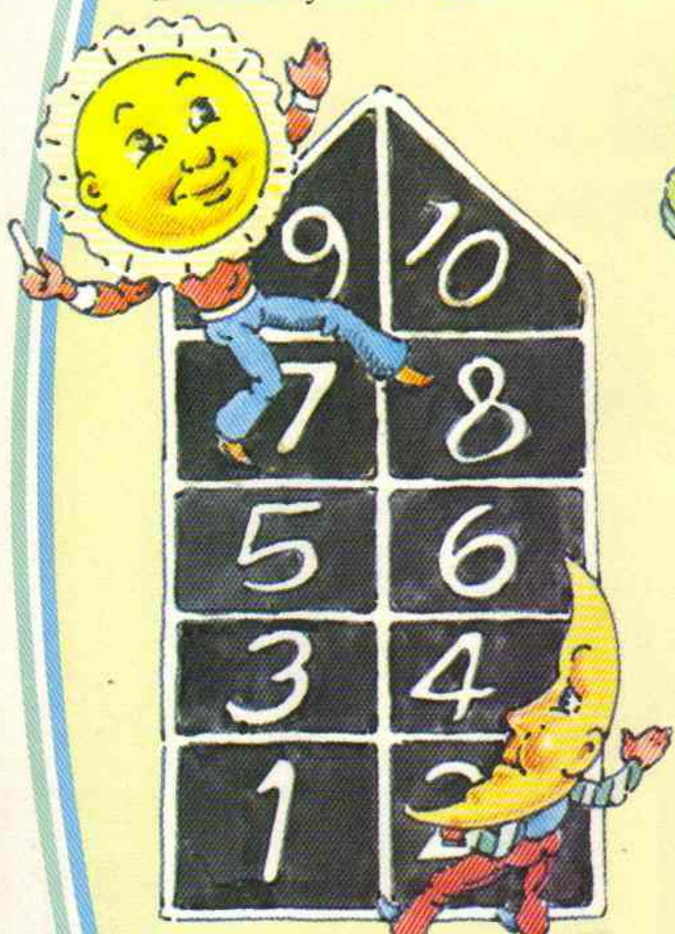


Factoids

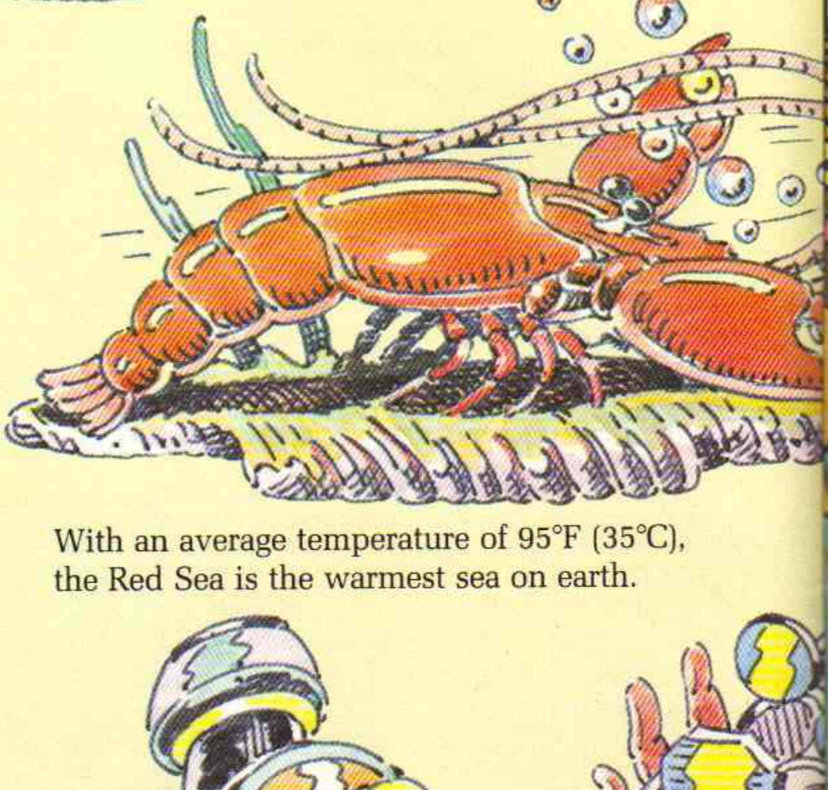
What are factoids? They are weird little facts that are stranger than strange, truer than true. Use them to wow your friends, amaze your family and dazzle your teachers.

New Jersey has more people per square mile than any other state.





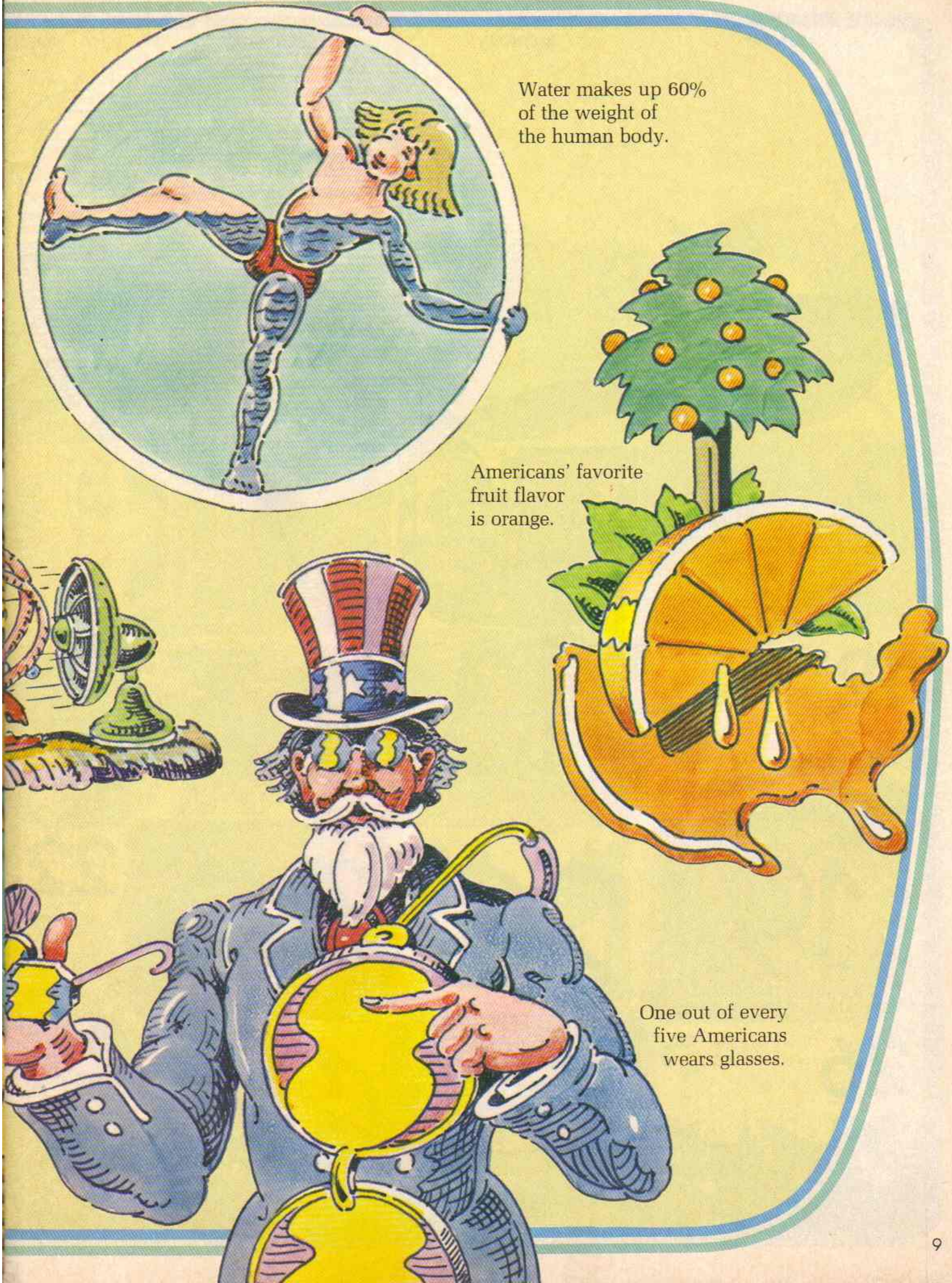
Jeff Meany and Jonathan Skow set a record by playing hopscotch for 20 hours and 16 minutes straight.



With an average temperature of 95°F (35°C), the Red Sea is the warmest sea on earth.

The longest train in the world had 500 cars and stretched for four miles.





Water makes up 60% of the weight of the human body.

Americans' favorite fruit flavor is orange.

One out of every five Americans wears glasses.

Earth Days

SUNDAY	MONDAY	TUESDAY	WEDI
			1 Henry I
5 Birthday of Robert Goddard, inventor of the liquid powered rocket. (1882)	6 The first movies are shown at Thomas A. Edison's lab. (1889)	7	The Chica begi bur 39 h (1
12 Christopher Columbus lands in the New World. (1492)	13	14 Charles E. Yeager flies the first plane faster than the speed of sound. (1947)	Birthday of discoverer of Mars—Deimos (18
19	20	21 Birthday of Alfred Nobel, inventor of dynamite. (1833)	22 T c is s fi (
26 The Erie Canal is opened. (1825)	27 The first underground & underwater railway in the US opens in New York (1904)	28	29

NESDAY THURSDAY FRIDAY SATURDAY

ctober

Ford demonstrates the "Model T," the first car sold at popular prices. (1908)

2

J.S. Thurman cleans up with a new invention—the vacuum cleaner. (1899) 3

4 *Sputnik*, the world's first artificial satellite, is launched. (1957)

8 Great ago Fire ns and ns for hours. 871)

9 The first electronic blanket is manufactured in Virginia. (1946)

10

Michael Gallen of Australia eats a record 63 bananas in 10 minutes. (1972) 11

15 Asaph Hall, the moons of s and Phobos. 29)

16

nes 17

The biggest newspaper ever—946 pages long—is published by the New York Times. (1968)

The first telegraph cable is laid in New York harbor. (1842) 18

The First Society of Whale Watchers is established to save the whale from extinction. (1851)

23

24 Birthday of microscope builder, Anton van Leeuwenhoek. (1632)

25 The first electronic wristwatch goes on sale. (1960)

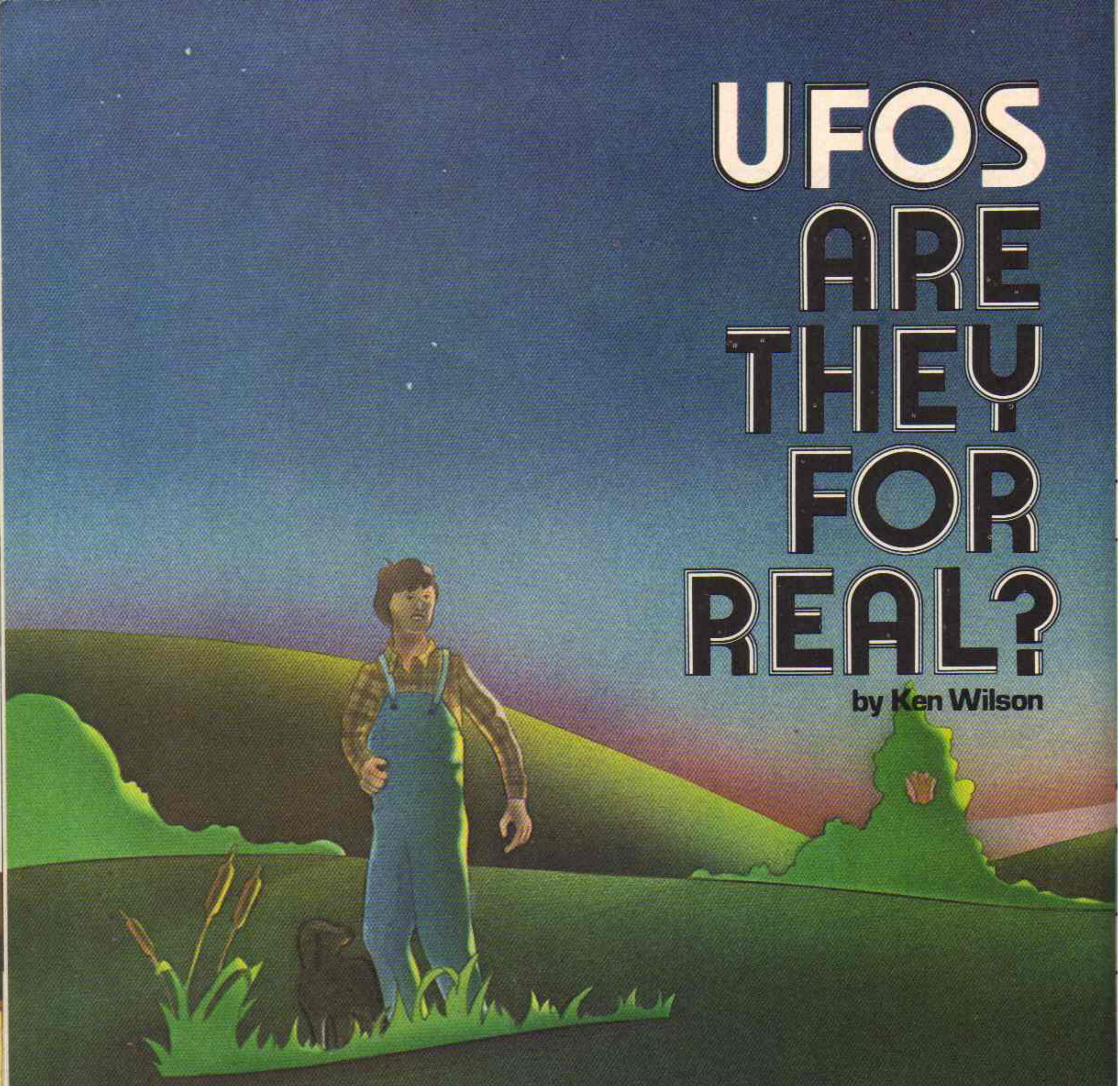
Birthday of Edmond Halley, the astronomer for whom Halley's Comet is named. (1656)

30

Happy National Magic Day. 31

UFOS ARE THEY FOR REAL?

by Ken Wilson



On November 2, 1972, a high school student named Ronald Johnson was tending sheep on the family farm near Delphos, Kansas. It was just after dark.

As Ronald headed in for dinner, he saw something that made him forget all about food. Just beyond the house, he saw a "glowing, mushroom-shaped object." It was hovering two feet above the ground. It roared loudly. Ronald watched the object for several minutes. He was afraid to stay, but too fascinated to run. Suddenly, the sound changed to a loud whine. The object then took off into the night sky. The bright flash of lift-off left Ronald temporarily blinded.

What you have just read is a famous story about UFOs—*U*nidentified *F*lying *O*bjects. Did this thing happen? Maybe. But *what* happened? Was this "sight" a spaceship, or was it an optical illusion? And finally, what does this story mean? Does it prove anything?

Those are the kinds of questions that UFO



investigators try to answer. Every year, thousands of UFOs are sighted around the world. A "sighting" doesn't mean a flying saucer was spotted. It means someone saw a strange light or object he could not immediately identify.

Most scientists think these sightings usually *can* be explained. They have discovered that UFOs often turn out to have been reflections from the sun, evening stars, swamp gases, or even flying birds. These scientists want *physical proof* of visitors from another planet. Then, and only then, will they admit UFOs could be visitors. These scientists are called "UFO skeptics."

A True Believer

Other scientists and writers disagree. They believe it is possible that an unexplained UFO was really a ship from space. Few of these UFO believers say that we *definitely* have been visited. But they *do* say unexplained flying objects make them wonder.

Dr. J. Allen Hynek is one of the best-known believers. He is an astronomer and the director ➤➤



Left: Some UFOs can easily be explained. This odd-looking object above the trees turned out to be a cloud. These strange-shaped clouds appear in hilly countries like Norway, where this photo was taken.

of the Center for UFO Studies in Chicago. He has spent more than 25 years studying UFOs.

"Most sightings can be explained," Dr. Hynek admits. "Usually people are seeing things like weather balloons, meteors or satellites. But there are cases—as many as 10 per cent of the sightings—that we can't explain."

Dr. Hynek says that UFO reports often come from "serious" people. He notes that some have even taken lie detector tests to prove they did not "make up" their stories. Hynek also points out that physical proof has been found in places where UFOs were supposed to have been. This evidence includes things like burn marks on the ground or strange chunks of metal. Some of it, says Hynek, is convincing.

Astronomer John Mosely has a different opinion. "Eyewitnesses, no matter how serious they are, just aren't reliable. When they see something that's strange, they sometimes get carried away in all the excitement. They stop thinking logically. In many cases, witnesses change their stories later on."

No Real Proof

Mosely, like many other skeptics, claims that no really convincing evidence has ever been proven to have come from a UFO. "Every burn linked to a UFO landing *could have* been made by gasoline and matches," he says.

Both believers and skeptics agree on one thing: it *is* possible that there is life in outer space. But while believers say that this is proof that UFOs could have been here, skeptics still wonder.

"A space ship that came millions of miles would



Above: This UFO remains unidentified. Warren Smith and some friends were returning from a camping trip in Canada when they saw this "saucer" in the sky. No one has yet explained what it was.

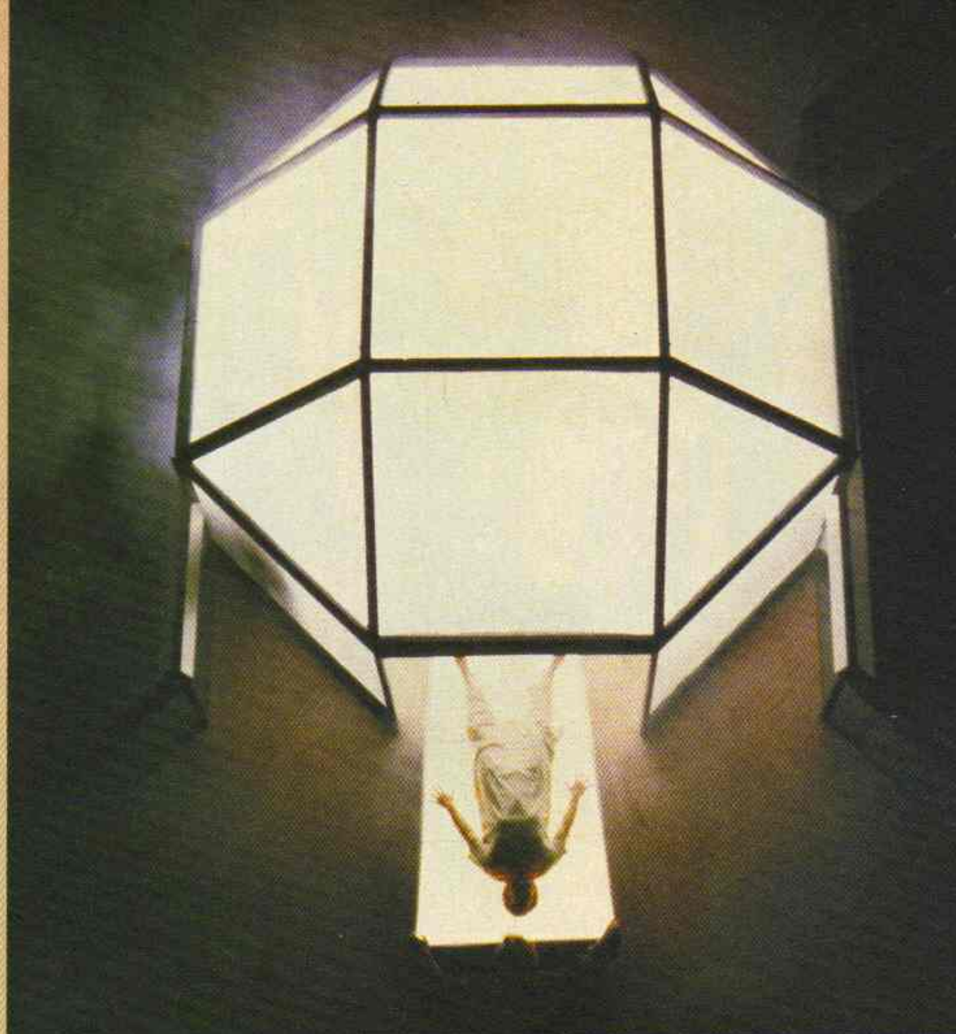
have to travel very fast and very far," writes scientist Isaac Asimov. "To make the trip, the ship would have to be constructed from metal much stronger than any we know on earth. In 30 years of UFO sightings, we've just never found anything like that."

The argument will probably go on for a long time. UFO believers will continue to point to the story of Ronald Johnson and the thousands of others who say they've seen UFOs. Skeptics will keep saying that without proof, UFO stories are just that—stories.

What do you believe?

Right: George Orr has a strange problem—all his dreams come true. George is the main character in Ursula Le Guin's science fiction story, 'The Lathe of Heaven.'

Below: George meets with Dr. Haber. The doctor thinks he can help George control his dreams.



Meet Ursula Le Guin



A Writer Who Brings Dreams to Life

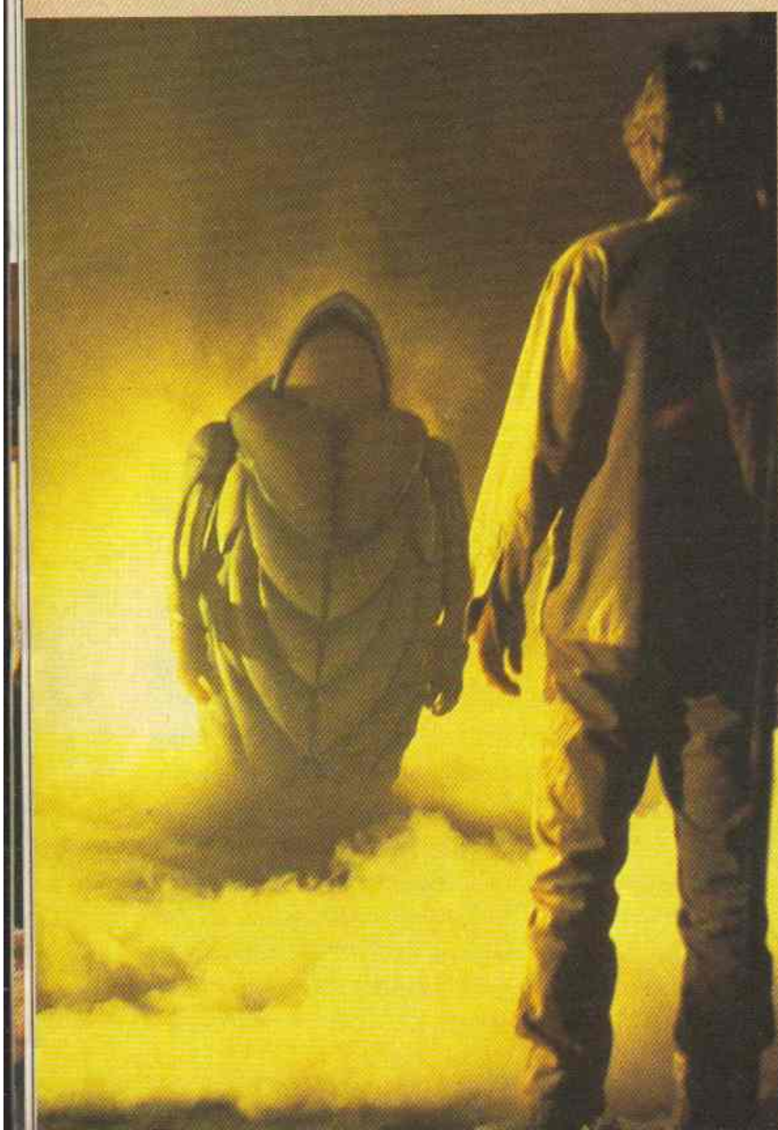
by Nancy Naglin

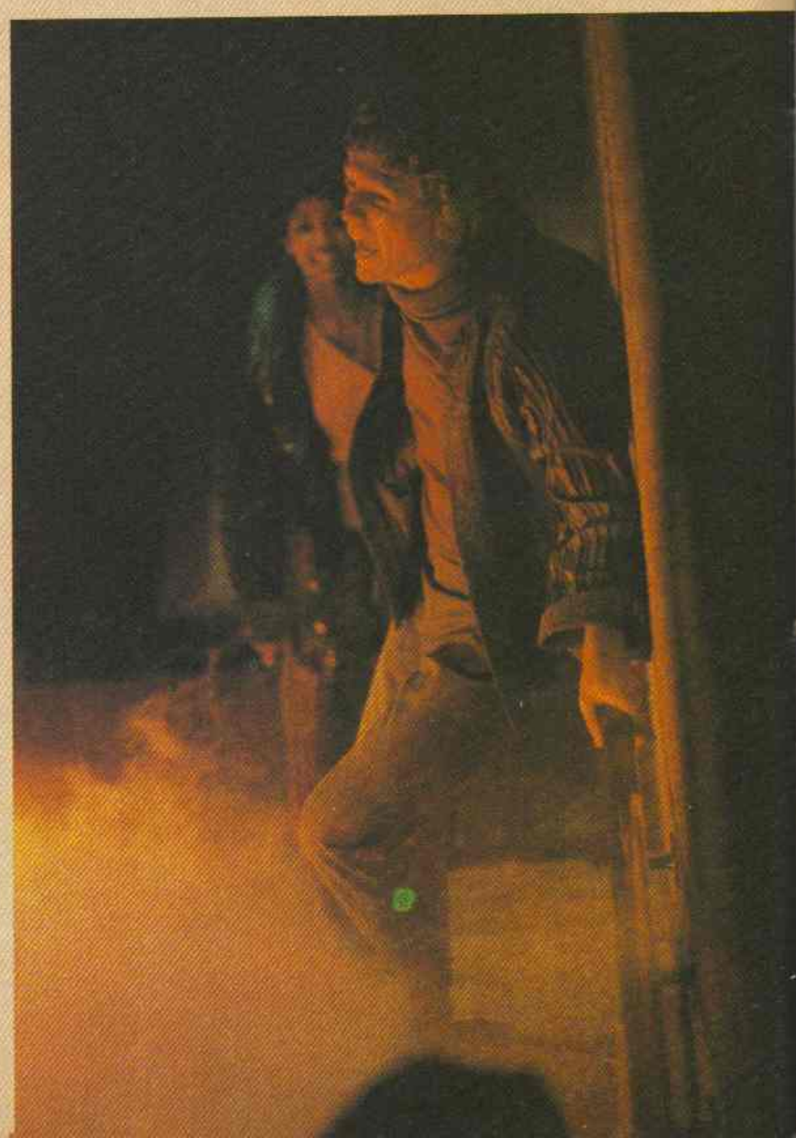
Can you imagine what life would be like if all your dreams came true? It sounds wonderful. But when it happened in a story to George Orr, it turned out to be a nightmare. A doctor tried to help George control his dreaming. But that only made things worse. Together, they almost destroyed the world!

You might have seen this story on television earlier this year. It is from a book ➤➤



Three dreams that came true:
Left: George dreams that everyone in the world turns gray.
Below left: He dreams of giant, green invaders from the moon.
Below right: George dreams of the fiery end of the world.







Above: Ursula at her desk at home in Portland, Oregon. "I still have my first story, written when I was nine," she says. "It was about a man chased by evil elves."

called *The Lathe of Heaven* by Ursula Le Guin. Ursula has written about many things—like dreamers and far-away planets and the future. She is one of America's finest science fiction writers.

What Is Science Fiction?

Many people think science fiction is about rockets and visitors from outer space. Some of it is, like *Star Wars*, *Buck Rogers*, and *Close Encounters*. Almost all science fiction uses some science to tell its story. But Ursula's stories aren't just about rockets or space battles.

"The most interesting science fiction is about people like us," she says. "They may live in the future or on another planet, but they still think and feel like we do. By reading about people in a different world, we can get a new angle on ourselves. We can see the world in a fresh way."

A Story about Evil Elves

Ursula, whose mother was a writer, has been writing since she was very young. At first she did it just for fun. "I still have my first short story, written when I was nine years old," Ursula says. "It was about a man chased by evil elves. People don't believe him. They think he's crazy. But finally, the elves wiggle in through the keyhole and get him."

As much as she liked to write, Ursula didn't think she'd spend her life working as a writer. She wanted to become a scientist, like her father. "At the time, though, no one encouraged girls to become scientists," she says. "And I was poor in math." Instead, she began working as a French teacher. But she never stopped writing.

The first time Ursula had a story printed in a magazine, she was nearly 30 years old. Her first book didn't come out until she was 35. "I guess I was a slow learner," she laughs. Since then, she has published more than 10 books and dozens of stories.

The Kids Help, Too

Where does Ursula get ideas for her stories? Like many writers, she says she doesn't really know. She says it often feels like the stories are out there, somewhere, waiting to be discovered. She just has to find them.

Ursula's three children—Elisabeth, Caroline and Ted—*have* given her some ideas for stories. "Once when Elisabeth was small, she asked me to write a story about creatures called 'Shings,' " Ursula remembers. " 'What are they like?' I asked her. 'They were evil,' she said. So I took her ideas and put them in a book I called *City of Illusions*."

Some sci-fi can be made up. But science fiction writers don't make *everything* up. They have to know what they're writing about. Before Ursula wrote *The Lathe of Heaven*, she spent a lot of time studying dreams and what scientists know about them. "In science fiction, whatever you invent has to fit into science as we know it. We know there aren't any people on Mars. So you can't write about green people living there."

Wizards and Dragons, Too

Ursula *does* write about things that don't fit into science. But those stories aren't science fiction. They're called *fantasy*. She has written three fantasy books for kids. They are about a boy who grows up with dragons, becomes a wizard, and goes on a long magical trip. These three books are called *The Earthsea Trilogy*.

Though she writes many other kinds of books, Ursula is still best known as a science fiction writer. That doesn't bother her, she says, because science fiction can be enjoyed by all kinds of people. "Science fiction appeals to anybody who has an imagination and curiosity. It's also fun, because everyone likes a good story."

Mystery Machines | A SCI-FI QUIZ

XK-730J was a robot probe sent to Earth from a distant, advanced civilization. The robot's task was to select some common Earth inventions and send back a description of them. XK described them perfectly. But most Earthlings would have a hard time guessing what inventions the robot was describing. Can you figure them out? If you need help, check the word list.

air conditioner	frisbee	telephone
alarm clock	hair dryer	television
baseball	helicopter	tennis racket
casette tape recorder	photo copier	toaster
dishwasher	pocket calculator	vacuum cleaner
electric shaver	radio	yo-yo
elevator	refrigerator	

Answers on page 37. *Written by Mark Saltzman*

1. This chamber, about the size of a small room, can rise above the surface of the Earth, sometimes at a very quick speed. It can contain anywhere from one person to a small group. The Earthlings enter the chamber at ground level, operate the control board, and then reappear at a completely different height in a matter of minutes.

2. This device enables the Earthlings to make twins of certain objects. To do this, the operator places the material he wishes to reproduce into a light-proof compartment. There arises a low humming sound, then a flash of bright light. Within moments, a second object, which looks almost exactly like the first, appears in the lower chamber.

3.

This Earth invention has a shape much like our own Ray-beam Gun. However, instead of a beam, this device produces an invisible stream of air. It has a variety of controls by which the direction and temperature can be changed. The Earthlings have a most surprising habit of pointing this device at themselves while it is in operation.

4. Most Earthlings only dream of flying. But the ones who have tried this invention have found themselves suspended above the surface of the Earth. They can remain in one spot, not moving backward or forward, up or down. The only drawback is that while operating, this device generates a loud noise. Many Earthlings seem to find this unpleasant.

6.

This small electronic thinking device seems to be the first computer that an average Earthling can use. Certain patterns of reasoning can be performed by linking this device to a part of the Earthling's body. During this link-up, the computer becomes an extension of the operator's own brain, performing mental processes much quicker than the slow-witted Earthlings ever could.

7.

This flying disc is capable of fast, noiseless and completely clean air travel. It can be controlled by simple movements of one of the Earthling's hands. Much practice is needed to direct the craft to a particular location. It does not seem that the Earth people have yet discovered any practical use for this disc.

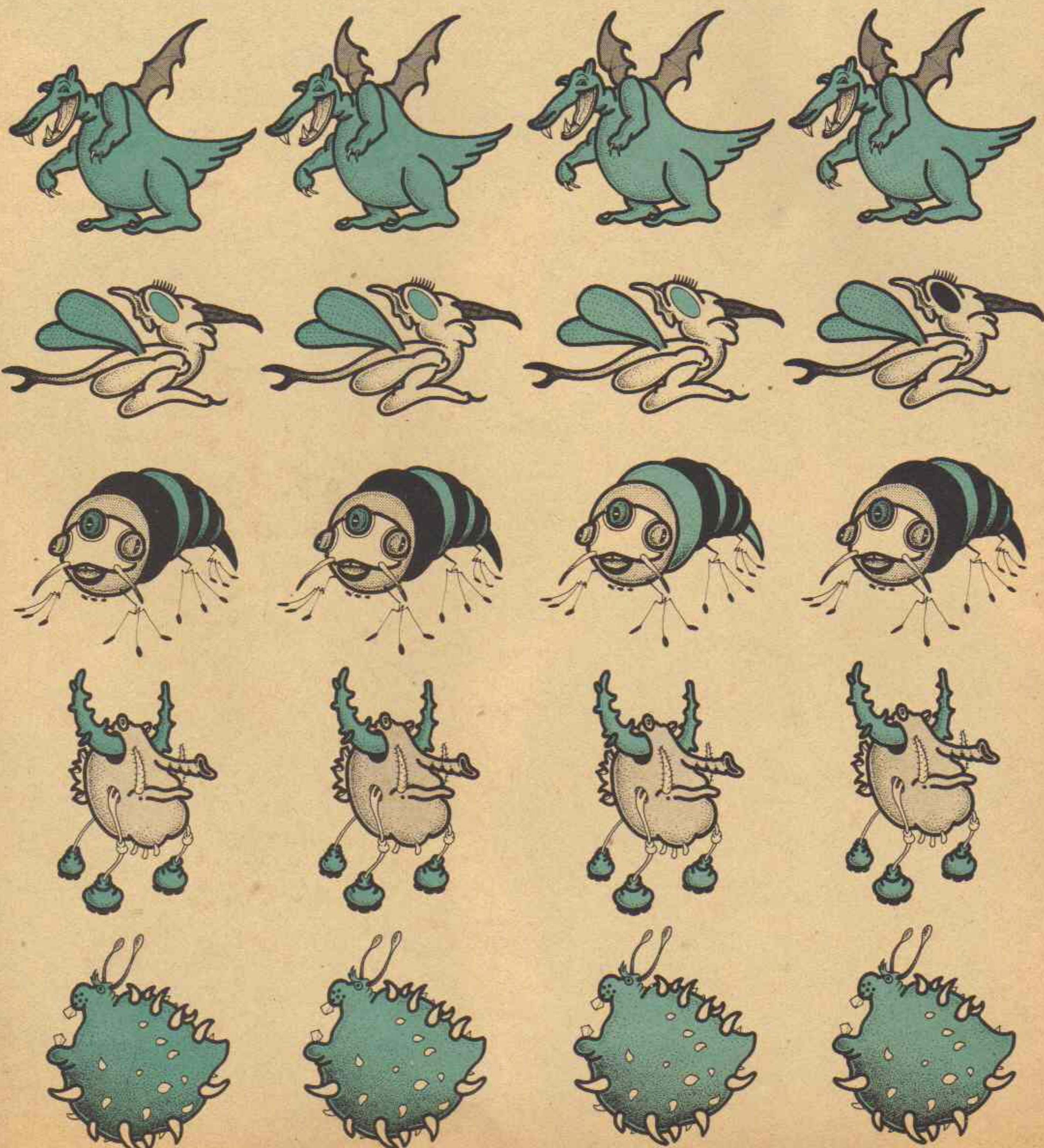
5. Within this device, the heat of planets close to the sun can be re-created. Placing eating matter within this machine's chambers can change its color, temperature, and moisture content. In most cases, the eating matter becomes tan in color and slightly crunchy. The Earthlings coat this matter with a greasy substance before it is to be consumed.

8. Invisible vibrations are preserved, stored, and later retrieved from this information storage unit. Each individual storage unit is smaller than an Earthling's hand, and yet information inside the units is so tightly packed, that the contents of each one could be stretched out for several meters.

Creature Features

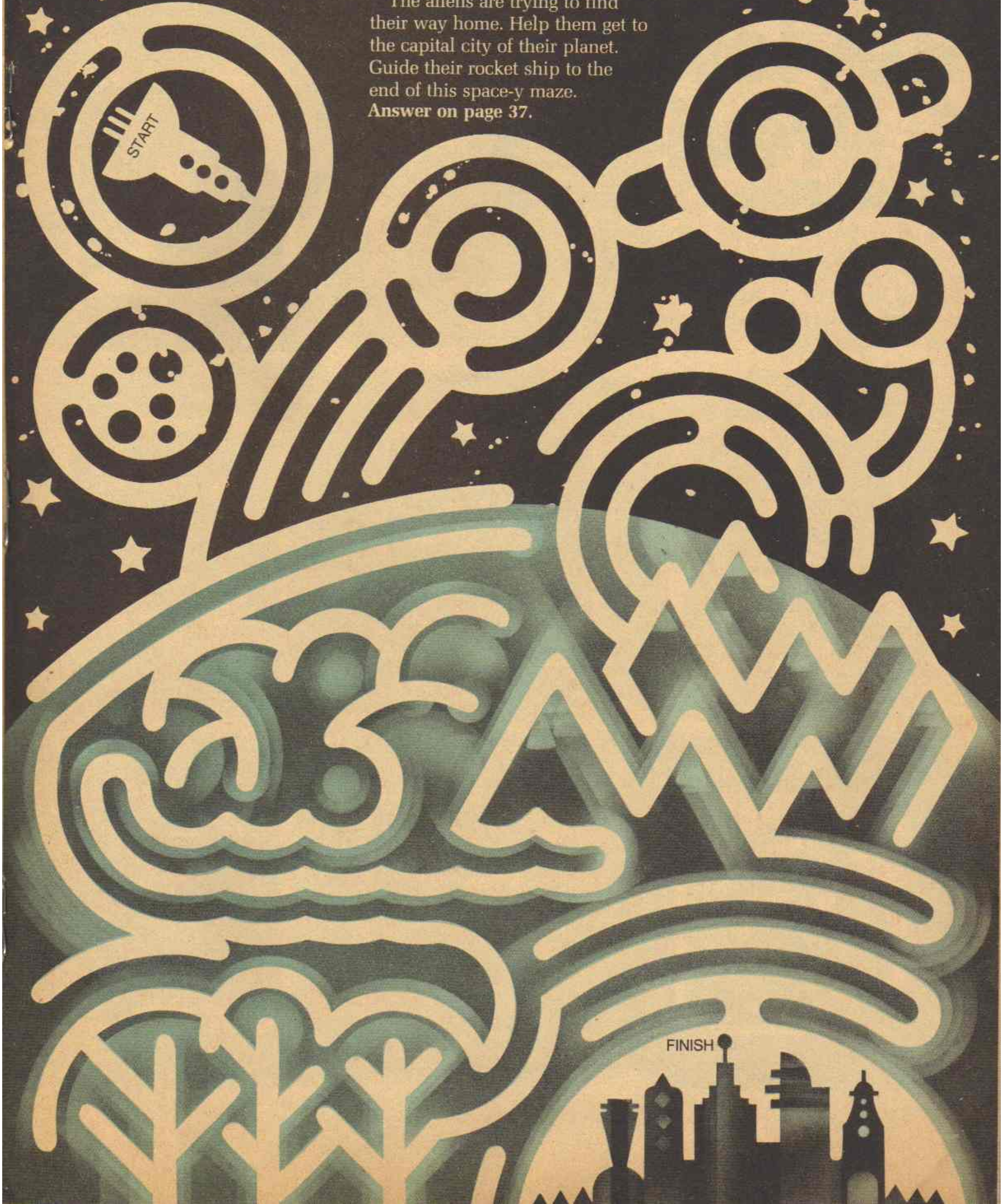
In each row, all the aliens—except one—come from the same planet. The imposter in every row has tried to disguise itself, but it is not the same as the others. Find the different alien in each row.

Answers on page 37.



Planet Maze

The aliens are trying to find their way home. Help them get to the capital city of their planet. Guide their rocket ship to the end of this space-y maze.
Answer on page 37.



Reviews & Previews

Science Fiction Starter's Kit

How do you become a science fiction expert? It's really very easy. All you have to do is read. Here is a list of books to start you off. If you've never read any science fiction, begin with one of the easier ones. You'll find most of the books listed here in your local library.



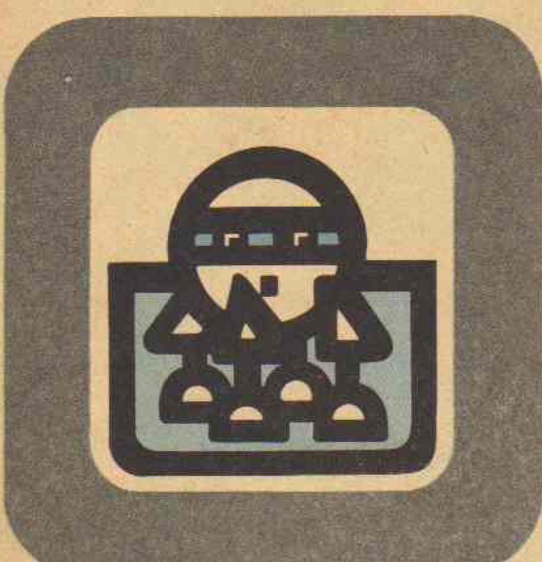
Kids in Space

A Wrinkle in Time by Madeleine L'Engle is the story of a young girl searching for her scientist father. He has been kidnapped in another universe. With the help of some very strange friends, she speeds through space and time to find him. *Wrinkle* was published by Farrar, Strauss, and Giroux.



Robots

A scientist invents a new kind of robot. She produces dozens of them in her laboratory. What happens next? To find out, read *Eight Stories from the Rest of the Robots* by Isaac Asimov. It's a collection of tales about this metallic bunch. Asimov, by the way, is a scientist who has written over 100 science fiction books.



H.G. Wells

Writer H.G. Wells was a character in the movie *Time After Time*. In real life, Wells was a scientist and science fiction writer who lived in the early 1900s. His two best-known books are *The Time Machine*, about a fantastic trip into the far future; and *War of the Worlds*, about a Martian invasion of Earth.



Life on Mars?

What would life be like for an Earth kid on Mars? Robert Heinlein imagined a book full of adventures for a 12-year-old kid named Podkayne. The book is called *Podkayne of Mars*. It was published by Berkeley Books.



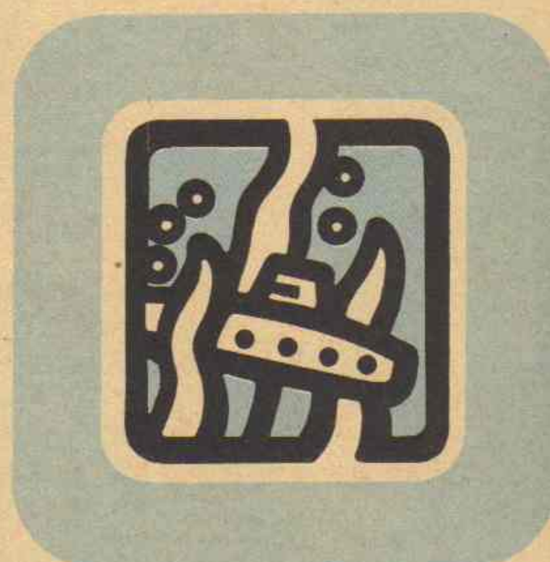
Green Friend

A Mushroom Planet? Mushroom People? You'll find out all about them in *Mr. Bass's Planetoid*, by Eleanor Cameron. Follow two friends on their space adventures. Meet their little green friend, Mr. Bass. Find out if he can help them save the earth.



Jules Verne

If you've played the "Journey to the Center of the Earth" game in this issue, you've met this famous French writer. His books, written 100 years ago, are still fun today. A lot of his predictions have already come true. A lot more haven't . . . yet. Verne's best-known books include: *20,000 Leagues Under the Sea*, *Off on a Comet*, and *From Earth to Moon*.



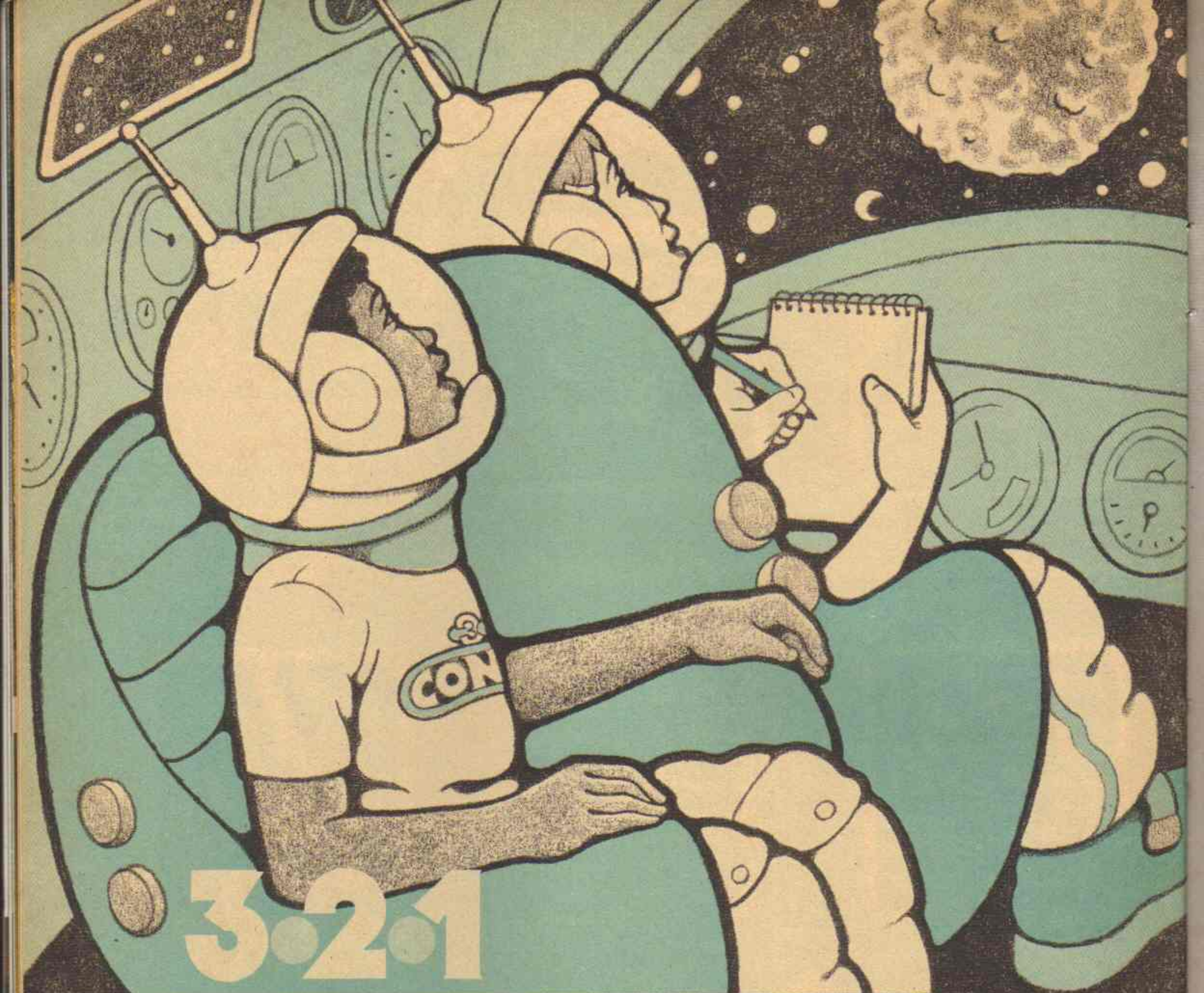
Sci-Fi in the Past

Science fiction isn't always about the future. It can be about the past. Imagine taking a trip back 300 years—on a New York City subway train! John and Sarah did, and ended up in the New Amsterdam of 1664. Read all about it in *The Magic Tunnel* by Caroline Emerson.



Ursula K. Le Guin

Ursula is famous for her science fiction, but she also writes fantasy. *The Earthsea Trilogy* is her three-book series for kids 12 and up. It's the story of Ged, a boy who becomes a wizard, goes on a journey to find a magic charm, and visits the land of the dead. Start with the first book, called *The Farthest Shore*.



3·2·1 CONTEST

Invent a Planet

Imagine it's 200 years in the future. You are aboard the first spaceship to reach a planet outside our solar system. People on earth are anxious to find out what you've discovered, so you must send a report.

Write to CONTACT as if you are really on the flight. Give the planet's name and describe everything you can about it. You must send back a drawing of what the planet looks like.

The report should describe how it feels to be on the planet. Are there any living things there? If there are human-like beings, describe them and their civilization. Remember, this is a description of a planet and then the kind of society you find there. Explain carefully, because earth's knowledge of the planet depends on you.

Send the drawing, description, your name, address and T-Shirt size to:

3-2-1 CONTACT, Sci-Fi Contest
P.O. Box 599
Ridgefield, NJ 07657

Get them to us by October 15, please. Our favorites will get a T-Shirt. Good luck!





Pocket Zoo

Animals of the Ocean

This month's animals live in or near the five oceans of the world. The Pacific, Atlantic, Indian, Arctic and Antarctic Oceans cover about 70% of the earth.

Animals live throughout the oceans. They include the largest animal in the world, the blue whale, and animals so small they can only be seen with a microscope. From the biggest to the smallest they have one thing in common. They depend on the ocean, with the water and food it provides, to survive.

How to Make Your Pocket Zoo

To make your animal cards, you need scissors, 4"x6" index cards (or pieces of cardboard the same size) and some sticky stuff.

1. Cut out your six animal cards along the dotted lines.

2. Paste or tape the animal to one side of the index card. Do this so that the information about the animal *hangs over the side*. (picture below)

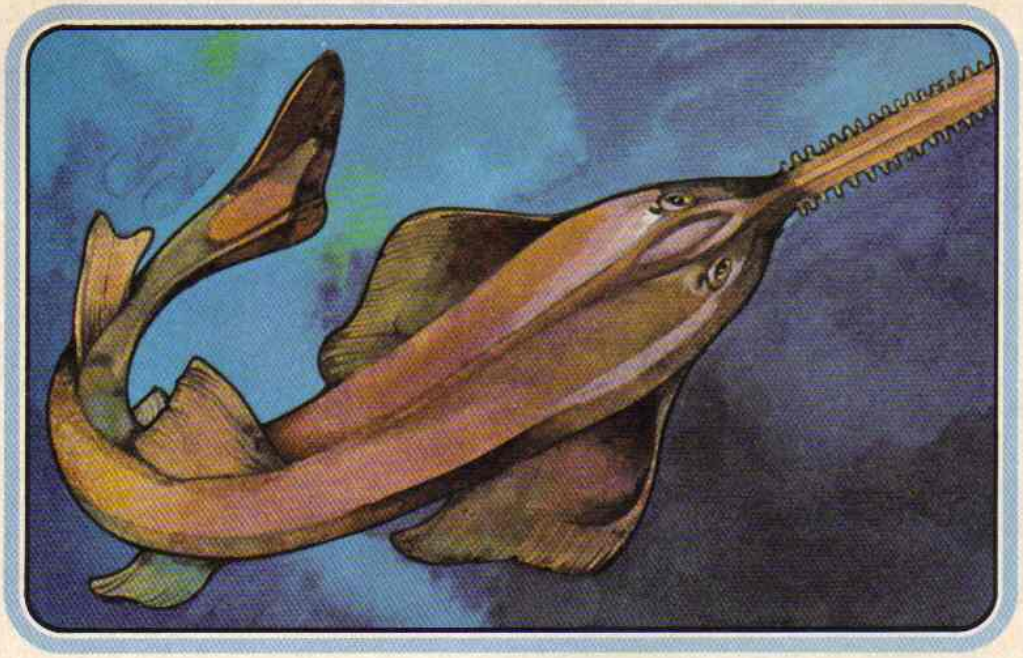
3. Now fold the flap with the information so that it is on the back of the card. Glue this side, too.

4. Use the extra space on the back for anything else you might want to write about each animal. Your pocket zoo is ready.









Sawfish

Category: *Fish*

Size: Up to 15 feet (4.5 m) long, including its saw.

Weight: Up to 700 pounds (317 kg).

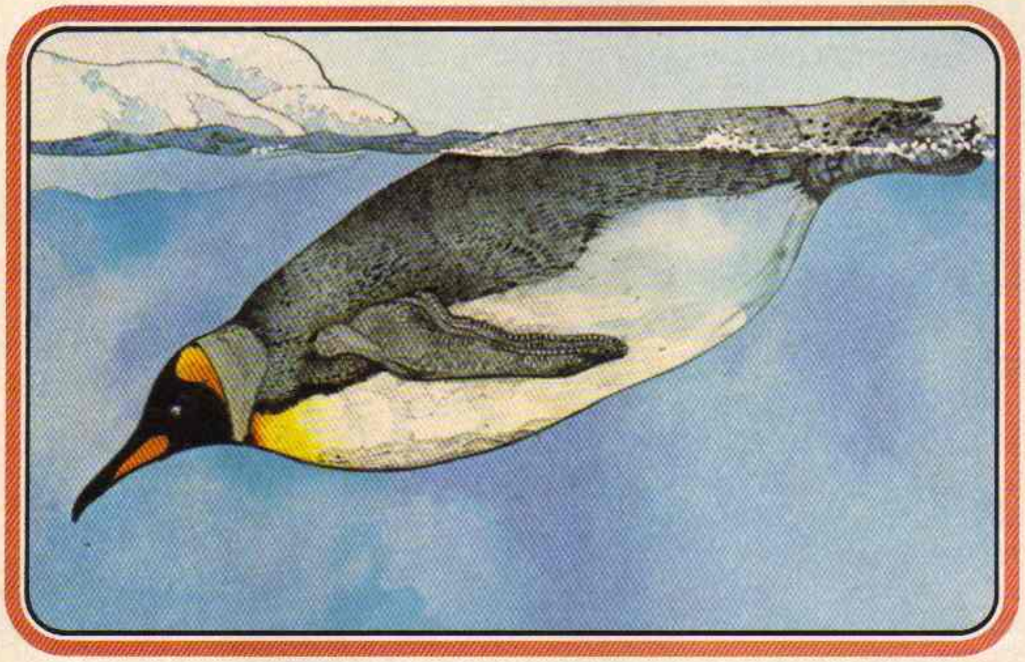
Length of Life: Unknown.

Home: Warm, shallow seas.

Food: Smaller fish.

Fact: The sawfish uses its saw to catch its food and fight its enemies.

Scientific Name: *Pristis pectinatus*



King Penguin

Category: *Bird*

Size: Up to 3 feet (1 m) tall.

Weight: As much as 40 pounds (18 kg).

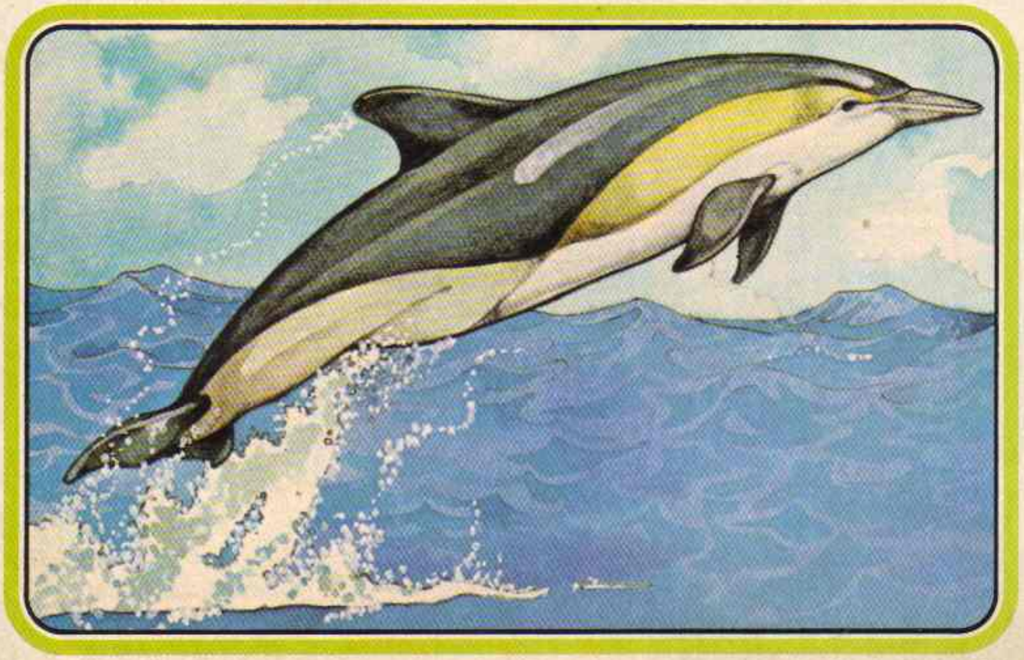
Length of Life: About 50 years.

Home: The seashore in Antarctica during the summer, where they mate; ice packs in the ocean during winter.

Food: Small fish and shellfish.

Fact: The male and female King penguins take turns keeping their eggs warm. While one hunts for food, the other places the eggs on its feet, covered by a flap of skin from its belly.

Scientific Name: *Aptenodytes patagonica*



Common Dolphin

Category: *Marine mammal*

Size: Up to 8½ feet (2.6 m) long.

Weight: Up to 165 pounds (75 kg).

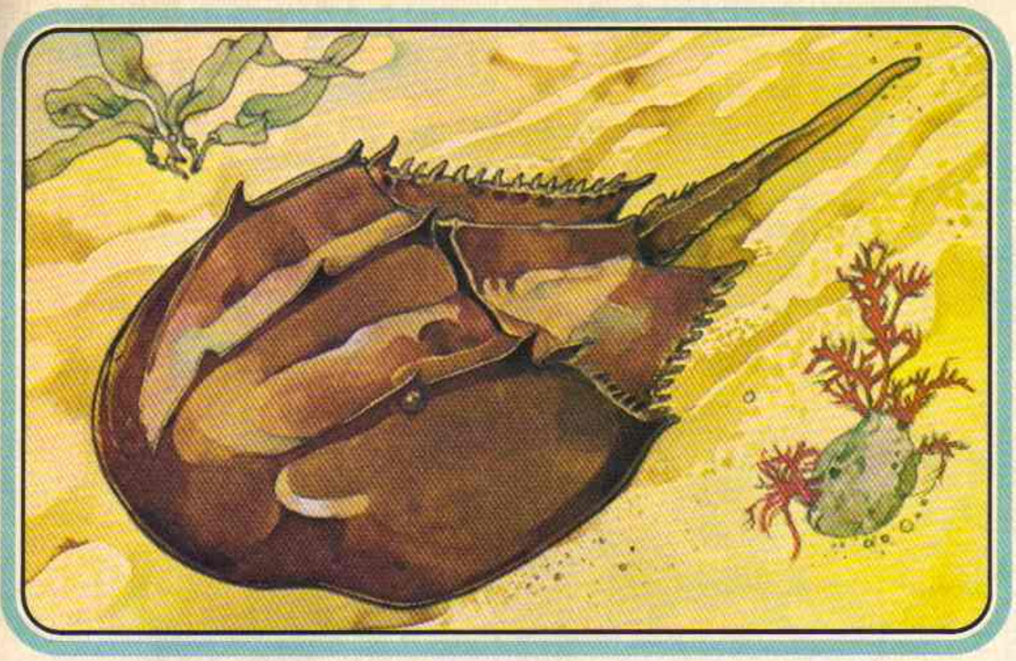
Length of Life: 25 to 30 years.

Home: Dolphins spend most of their time in warm waters.

Food: Small fish and shellfish.

Fact: Dolphins "speak" to each other with whistles, chirps and other sounds. They find things underwater by making high-pitched squeaks.

Scientific Name: *Delphinus delphis*



Horseshoe Crab

Category: *Arthropod* (relative of the spider)

Size: About 20 inches (.6 m) long, including tail.

Weight: Up to 8 pounds (3.5 kg).

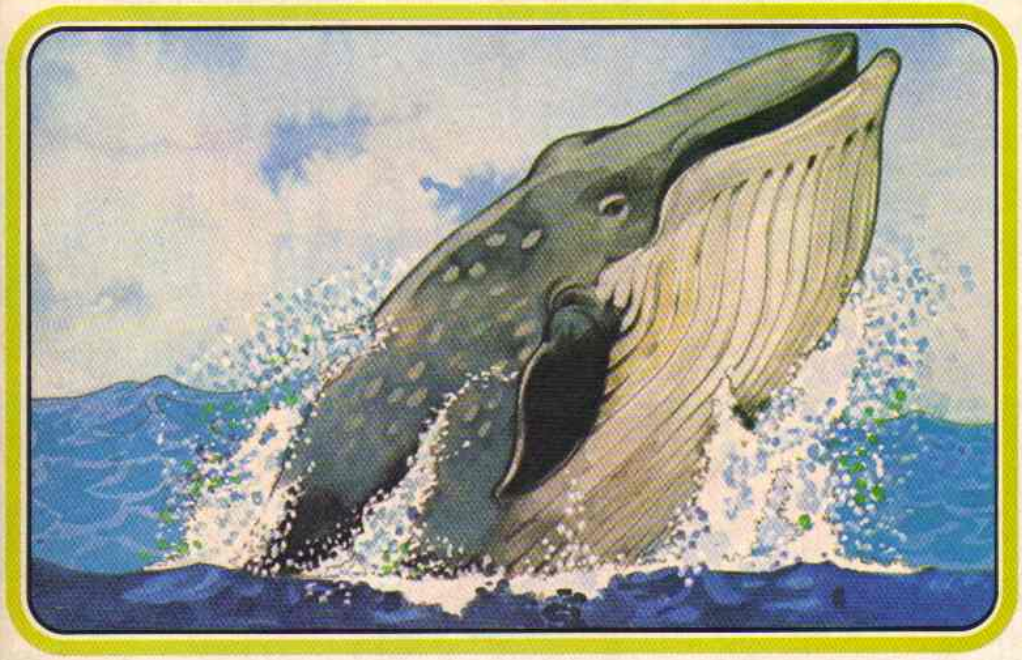
Length of Life: Up to 15 years.

Home: It lives on the bottom of the ocean where it spends most of the time eating. It lays its eggs on the beach.

Food: Mussels and marine worms.

Fact: The horseshoe crab is one of the oldest living animals. Fossils have been found showing the same animal living millions of years ago.

Scientific Name: *Limulus limulus*



Blue Whale

Category: *Marine mammal*

Size: Up to 100 feet (30 m) long.

Weight: Up to 100 tons (90,000 kg).

Length of Life: Unknown.

Home: Polar seas in summer, warmer waters in winter.

Food Mostly *krill*, a kind of small shrimp and its eggs.

Fact: A blue whale has no teeth. It uses a kind of screen, called *baleen*, to eat. When the blue whale opens its mouth, in rushes food and water. The whale pushes out the water through the baleen and traps millions of krill for its meal.

Scientific Name: *Balaenoptera musculus*



Sea Horse

Category: *Fish*

Size: From 1 to 12 inches (2.5 to 30 cm) long.

Weight: From ½ ounce (14 g) to several ounces.

Length of Life: The smallest live only one year. The large ones can live 5 years or more.

Home: In shallow warm waters, among seaweed.

Food: Mostly tiny shellfish; some plankton, and other tiny sea plants and animals.

Fact: The sea horse is the only fish able to coil its tail and hold onto branches of weeds.

Scientific Name: *Hippocampus*

The Muscles

by Rae Paige

Shhh! Don't move! See if you can be absolutely still for just one little minute. Shhh. Ten, nine, eight, seven, six, five, four, three, two, one . . . time's up. Did you do it? Not a chance! No matter what, your muscles are working. If you're breathing, your diaphragm—it's a muscle—is working to fill your lungs with air. If you're sitting, your back muscles are working to keep you from falling over. If you're reading this paragraph, muscles are making your eyes follow words. If you're alive at all, your heart is pumping constantly. GOTCHA!

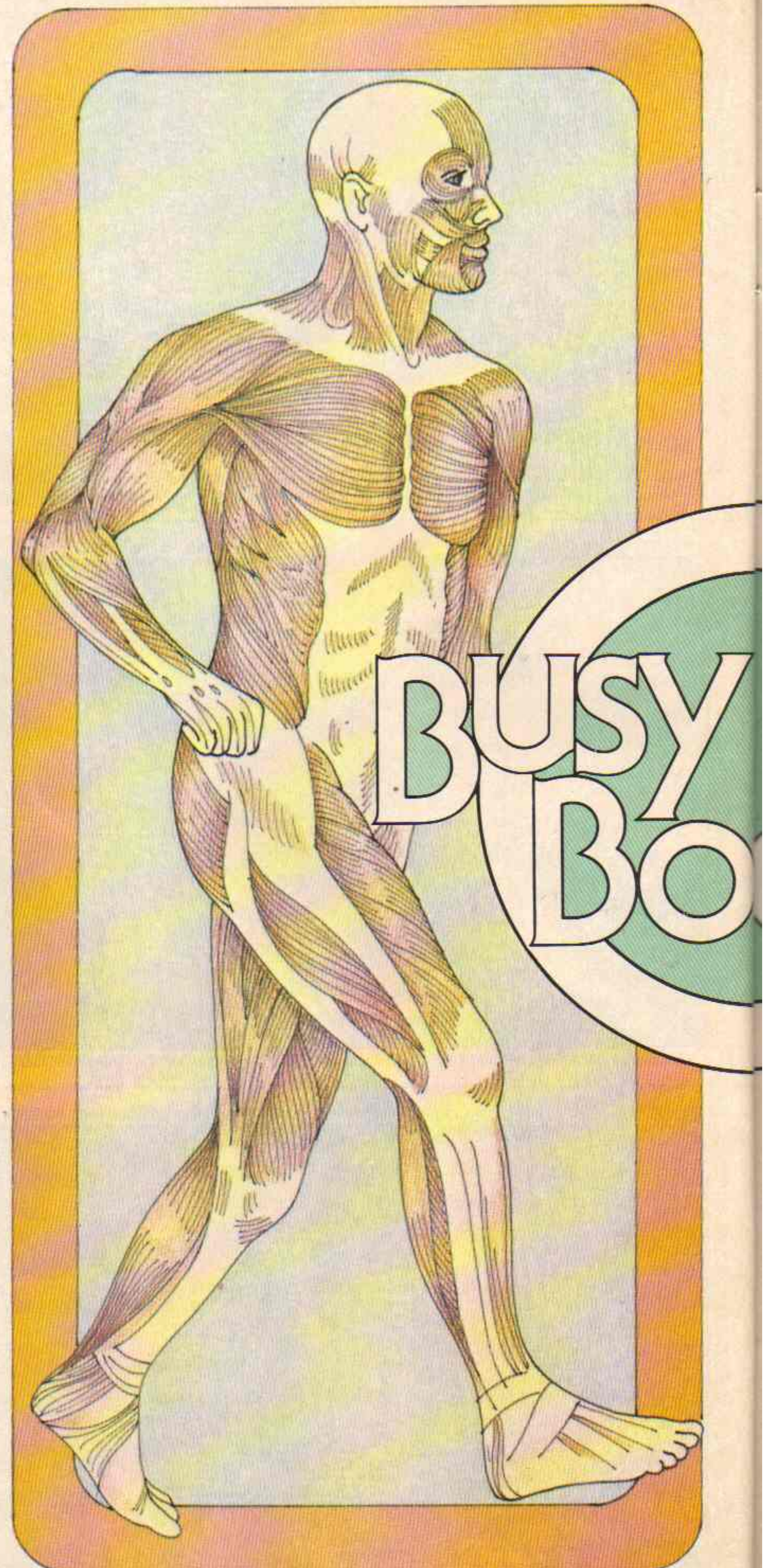
Meet Your Muscles

Muscles perform many different jobs—everything from running to snoring, breathing to digesting, hiccupping to blinking an eye. Muscles also line the organs in your body—like the stomach, heart and lungs.

If you stripped away your skin and fat, you'd find muscle underneath. There are about 650 muscles in your body. They help give you shape. Muscles themselves come in many shapes and sizes. How big they are depends on the jobs they perform.

The muscles that make your eyes blink, for instance, are tiny and thin like thread. The muscles that make you frown or smile are flat and only an inch long. The muscles in your legs are big and long and bulging.

You can divide muscles into three basic kinds. What are they? Keep reading!



Skeletal Muscles These are the muscles attached to your bones. They are called *voluntary muscles*, because they do what you tell them. If you are thirsty right now, you can tell the muscles in your arm to put this magazine down, and the ones in your legs to take you into the kitchen.

Skeletal muscles are also called *striated* (stry-ate-ed) muscles, because they look as if they are arranged in rows of stripes.

Skeletal muscles don't always do what you tell them to. For more on this, try the experiment on page 31.

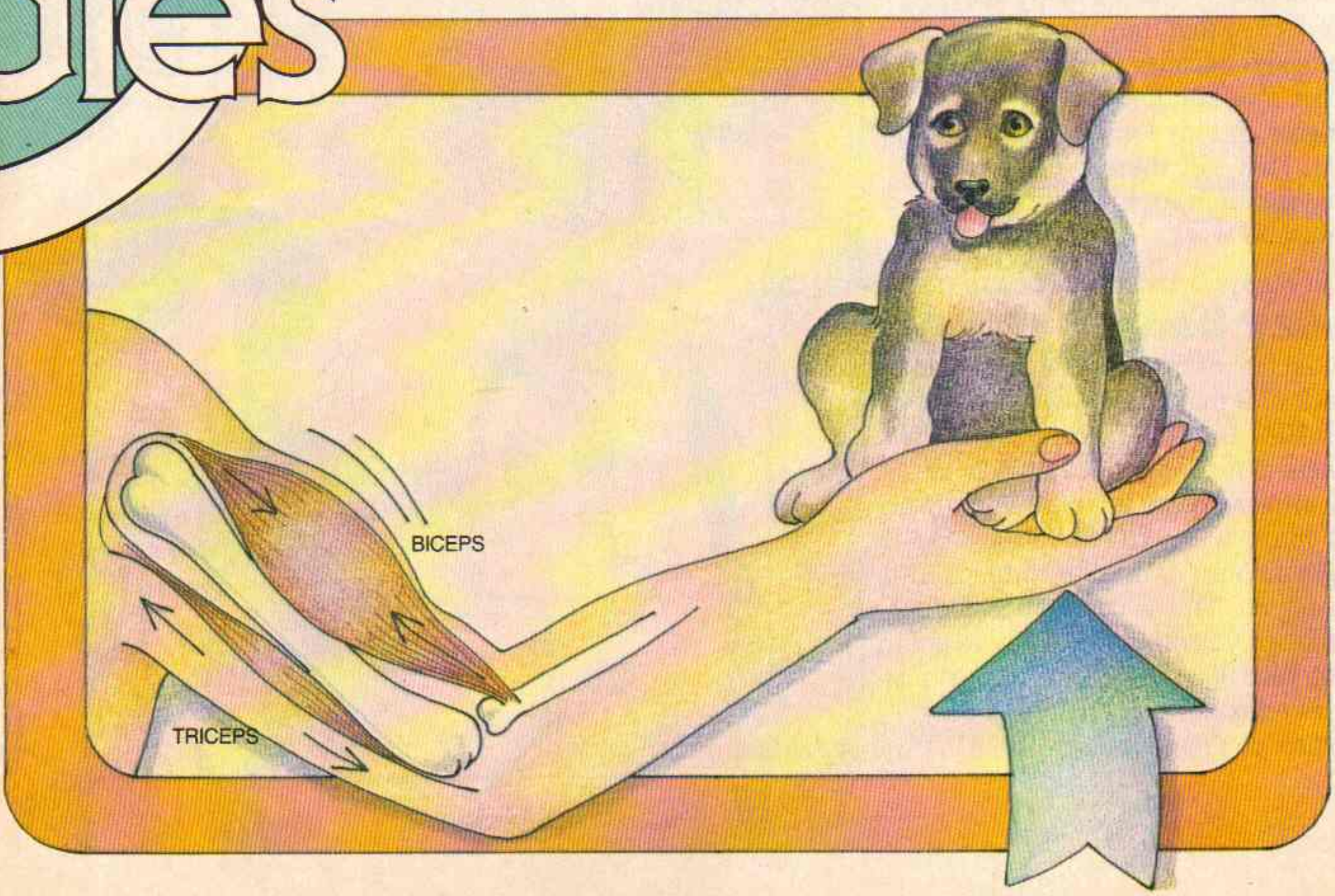
Smooth Muscles These muscles are also called *involuntary muscles*, because you don't control them. These muscles are the ones that line the organs of your body. They also make up the walls of your blood vessels. They are called smooth because—you guessed it—they look smooth instead of striped. These muscles don't respond as quickly or strongly as striped muscles do, but they also don't get tired as fast.

Heart Muscle This has got to be your most important muscle of all. Your heart is a combination of both skeletal muscle and smooth muscle. The heart is so strong that it beats constantly from before you're born to the day you die. For the average person, that would be about two and a half *billion* beats in a lifetime!

How Your Muscles Work

Your muscles work the way a spring does. Each muscle is made up of cells. When the muscle cells squeeze together or *contract*, the muscle gets smaller. The part of the body attached to the muscle moves.

Your skeletal muscles usually work in pairs. Touch your nose with your finger. To do this you must bend your arm. When you do, the biceps (BY-seps) muscle in your arm contracts. When you straighten your arm out, this muscle relaxes. Another one on the other side of your arm, called the triceps (TRY-seps), contracts. Your skeletal muscles are the quickest workers. It takes a fraction of a second for them to spring into action.



Tired Muscles

Your muscles need oxygen to work. That's why your heart beats faster and faster as you exercise. This pumps blood filled with oxygen to your muscles. They work great for a while. But a substance called *lactic acid* starts to build up in your muscles. It makes your muscles so tired that you just have to take a rest. You sit down huffing and puffing. While you relax, your muscles lose their lactic acid and a new supply of oxygen arrives. Then you are ready to get back to action.

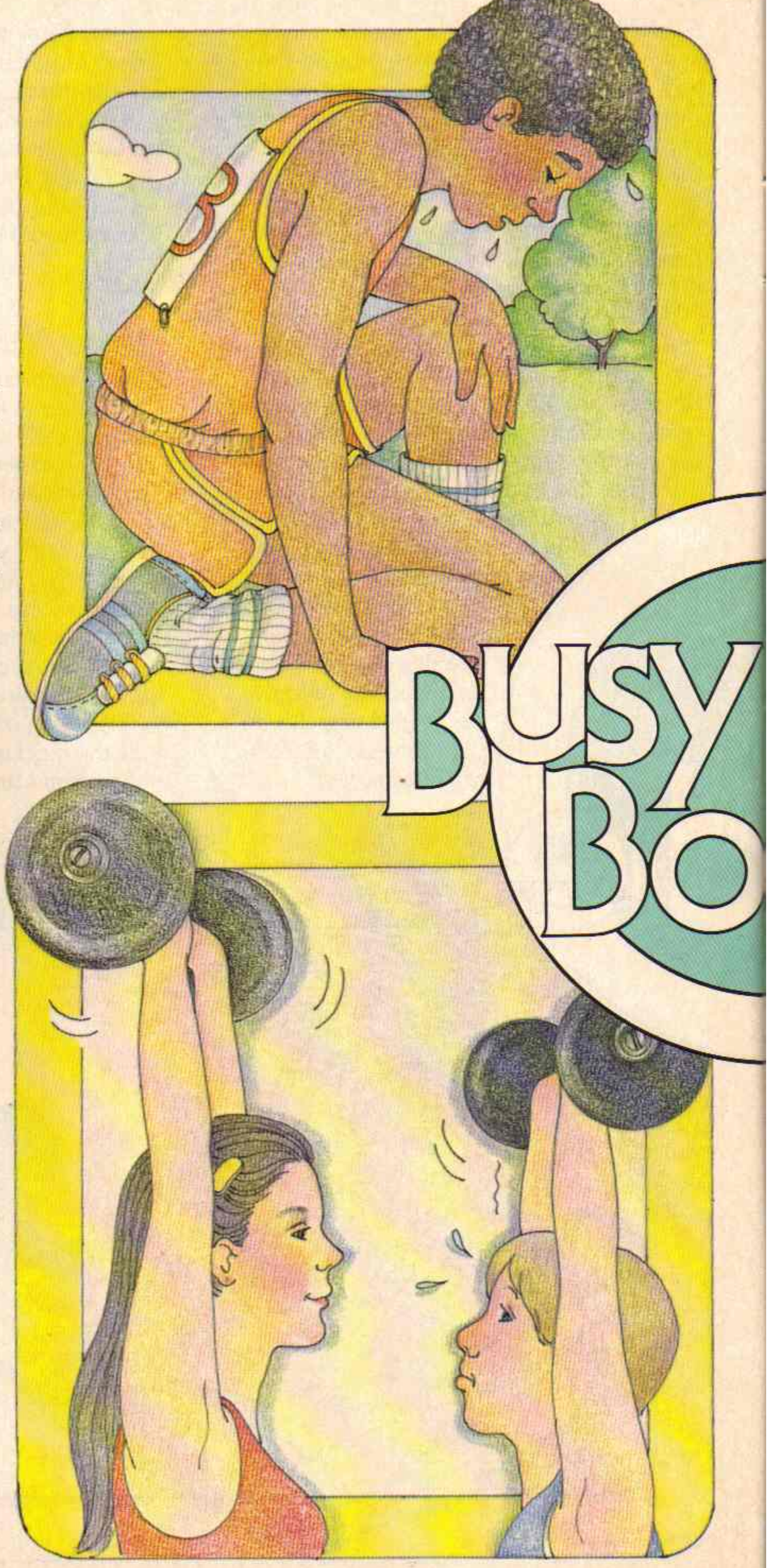
Your skeletal muscles get tired more easily than your smooth muscles. After all, who ever heard of someone's stomach getting too bushed to go on? Stuffed maybe, but not tired.

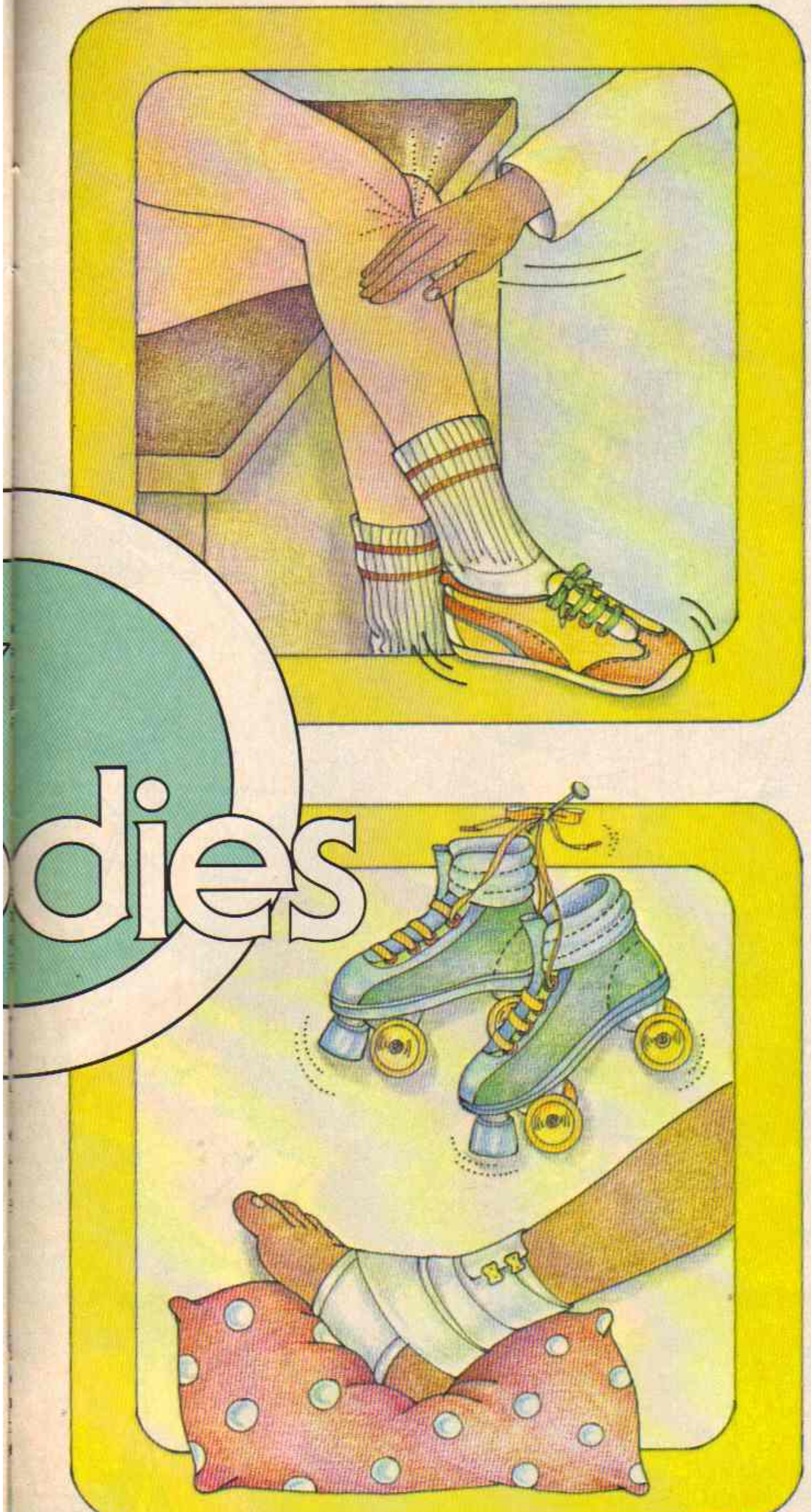
Body Builders

Any muscles that are exercised a lot over a long period of time will get bigger and stronger. Larger muscles are able to store more energy. They have more room for lactic acid to collect so that they don't tire as quickly. Because of the heavy exercise, a weightlifter's heart will be bigger and his lungs will hold more air. That way there is plenty of oxygen to make his giant-sized muscles work.

Lazy Bones

Exercise makes muscles bigger, and lack of it makes them weaker and smaller. But don't worry! Normally there is no danger of a muscle becoming so weak it won't work. Even if you're a lazy bag of bones, a certain amount of muscle contraction is going on. This is called *muscle tone*. It keeps your muscles ready to act in the case of an emergency. Your muscles relax almost completely only when you're sleeping.





Experiment on Your Muscles

As explained earlier, skeletal muscles usually do what you tell them. But not always. Try this little experiment.

1. Grab a friend.
2. Have her sit in a straight back chair. Tell her to cross her legs and relax.
3. Take the side of your hand and tap fairly hard right under the kneecap of your friend's crossed leg.
4. Keep trying until you get the "kneejerk" response. Her leg snaps forward. Switch places and see if she can make your leg do the same thing.

By hitting your friend's knee in just the right spot, you caused a muscle to contract. That's why her leg snapped forward. This twitch is called a *reflex action*. When you hit the right spot, it happens automatically.

Aches and Pains

What is a Charlie Horse? A Charlie Horse comes from an overuse and strain of a muscle. Some of the tiny blood vessels that bring oxygen to the muscle become sore. It will sometimes take several days for the soreness to go away.

What is a sprain? A sprain is the twisting of the *ligaments* or *tendons* that attach muscles and bones together. The most common places for sprains to occur are the ankles, knees and wrists. Cure? Ice pack and don't move.

What is a cramp? A cramp is a painful, uncontrolled contraction of a muscle. Some people think it's caused by too much exercise or by bad blood circulation. But no one's really sure. And the cure? Massage and heat.

Journey to the Center of the Earth

by Phyllis Keaton

If you took a trip to the center of the earth, what would you find? No one is really sure.

Over 100 years ago, Jules Verne wrote a science fiction book, called *Journey to the Center of the Earth*. It told about the adventures of Professor Lindenbrook, his nephew Axel, and their guide named Hans.

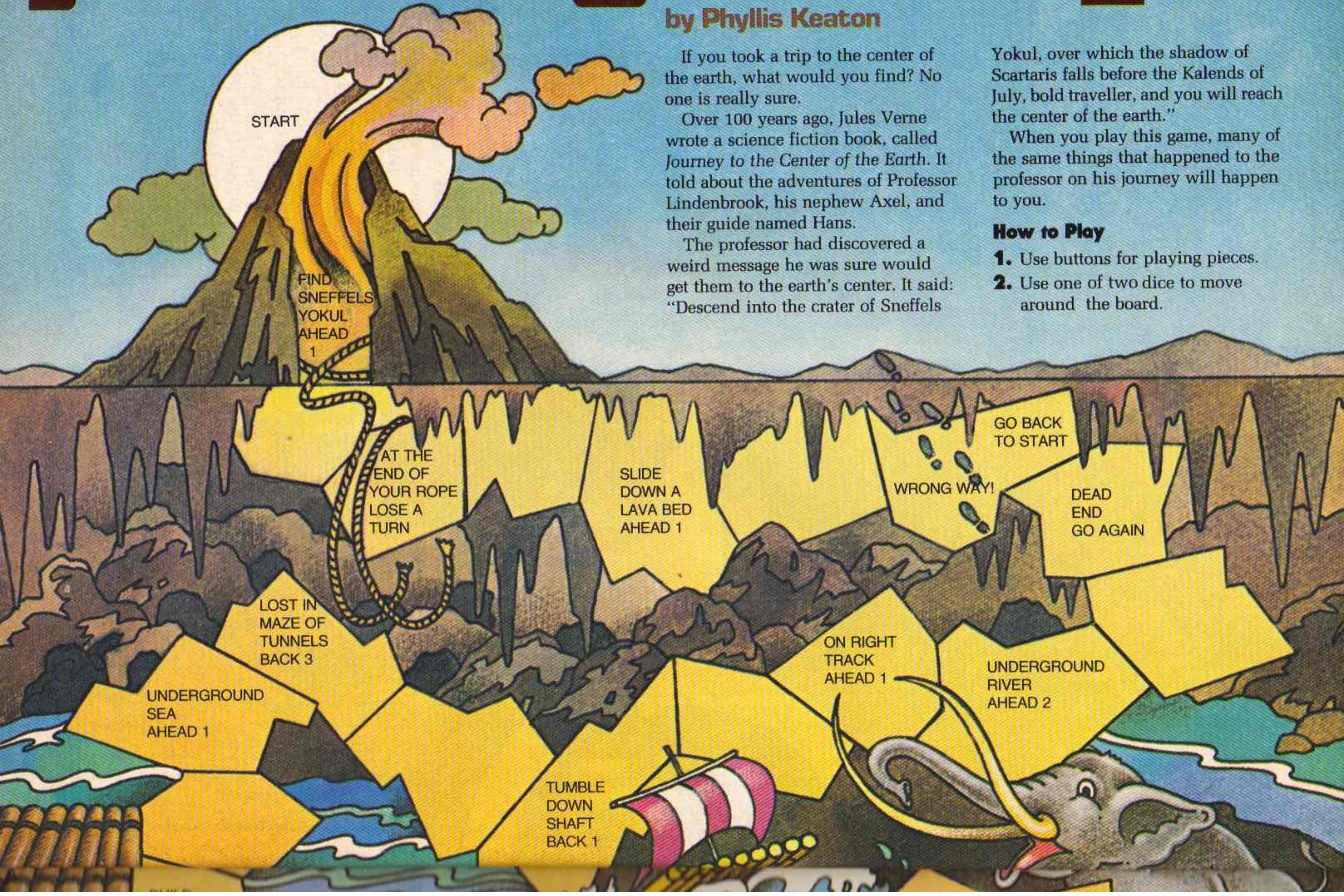
The professor had discovered a weird message he was sure would get them to the earth's center. It said: "Descend into the crater of Sneffels Yokul, over which the shadow of Scartaris falls before the Kalends of July, bold traveller, and you will reach the center of the earth."

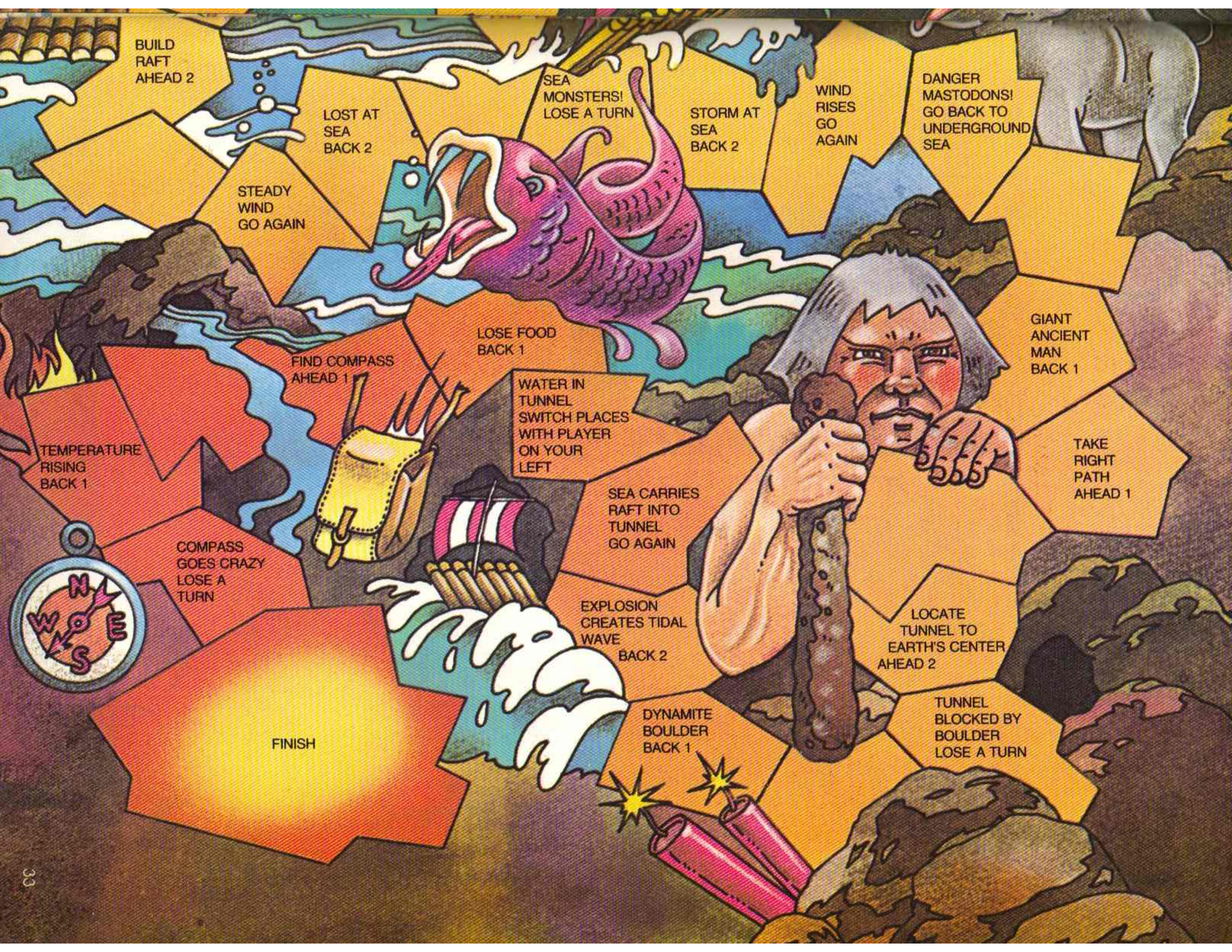
When you play this game, many of the same things that happened to the professor on his journey will happen to you.

How to Play

1. Use buttons for playing pieces.

2. Use one of two dice to move around the board.





BUILD RAFT AHEAD 2
LOST AT SEA BACK 2
STEADY WIND GO AGAIN
SEA MONSTERS! LOSE A TURN
STORM AT SEA BACK 2
WIND RISES GO AGAIN
DANGER MASTODONS! GO BACK TO UNDERGROUND SEA
GIANT ANCIENT MAN BACK 1
TAKE RIGHT PATH AHEAD 1
LOCATE TUNNEL TO EARTH'S CENTER AHEAD 2
TUNNEL BLOCKED BY BOULDER LOSE A TURN
DYNAMITE BOULDER BACK 1
EXPLOSION CREATES TIDAL WAVE BACK 2
SEA CARRIES RAFT INTO TUNNEL GO AGAIN
WATER IN TUNNEL SWITCH PLACES WITH PLAYER ON YOUR LEFT
LOSE FOOD BACK 1
FIND COMPASS AHEAD 1
TEMPERATURE RISING BACK 1
COMPASS GOES CRAZY LOSE A TURN
N
E
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FINISH

Any Questions?

by Joanna Martin

How many stars are in the sky?

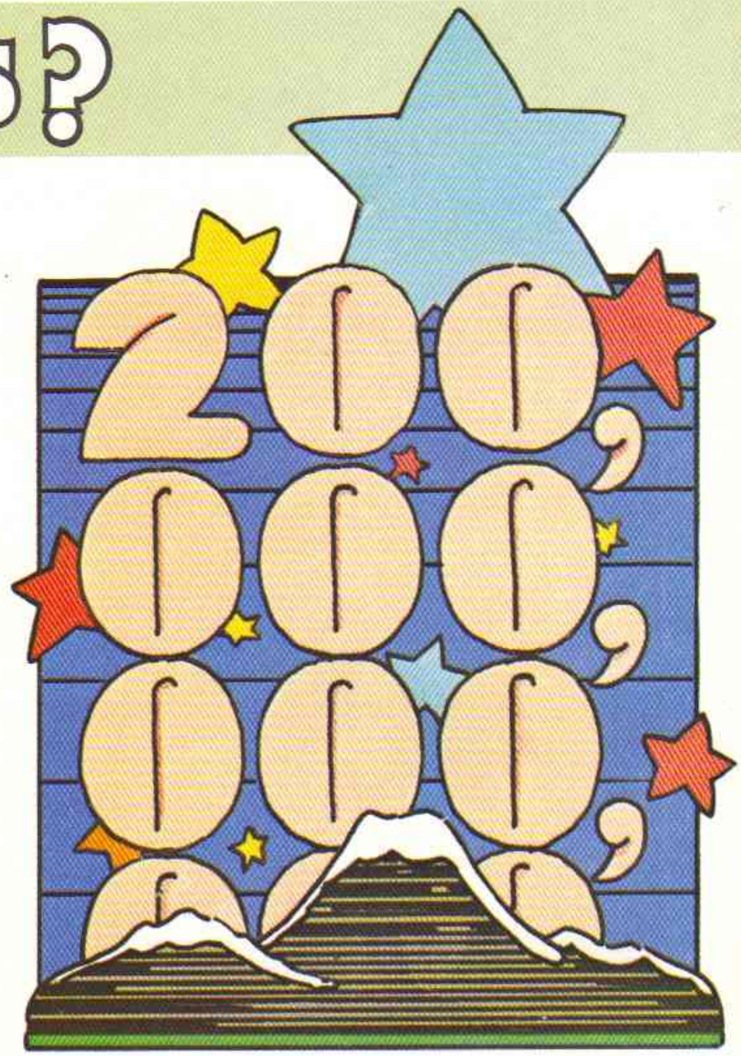
That all depends on how you count. If you live where there is no pollution in the air, you could count about 3,000 stars on a starry night.

But wait, there's more! Someone standing on the other side of the world would count about the same number. So now, you're up to 6,000.

But hold on, there are more! Telescopes allow people to see farther into space. More stars show up. With the most powerful telescopes about three *billion* stars can be seen.

Wait a minute! You guessed it. There are more! Scientists estimate that there are many more stars out there, that are too far away to see even with the biggest telescopes. How many? Oh, about 200 billion, billion . . . more or less. That's 200,000,000,000,000,000,000. And the number of stars is changing all the time. There are new stars being formed, while old ones are dying out.

Question sent in by Stephen Franklin, Los Angeles, CA.



Why don't spiders get stuck in their own webs?

Spiders make their webs out of silk. They have several *glands* in their bodies, where silk is produced. Some glands make silk that is dry. Others make sticky silk. These gooey threads are the ones that trap insects.

The spider knows which threads in the web are sticky and never steps on them. To make extra sure it doesn't get stuck, a spider is covered with oil. If its body touches the sticky threads by accident, the slippery spider slides right off!

Some bugs have figured out how to outsmart a spider. Take moths, for instance. Their wings are covered with powdery scales. If they hit a web, they leave the powder behind and fly right out.

Then there's the stink bug. When it's caught, it gives off a liquid. This softens the threads holding the bug and it drops right out of the trap!

Question sent in by Deborah Lynn Muldawer, Albuquerque, NM.



Do you have a question that no one seems able to answer? Why not ask us? Send your question, along with your name, address, and age, to:

Any Questions?
3-2-1 CONTACT
P.O. Box 599
Ridgefield, NJ 07657

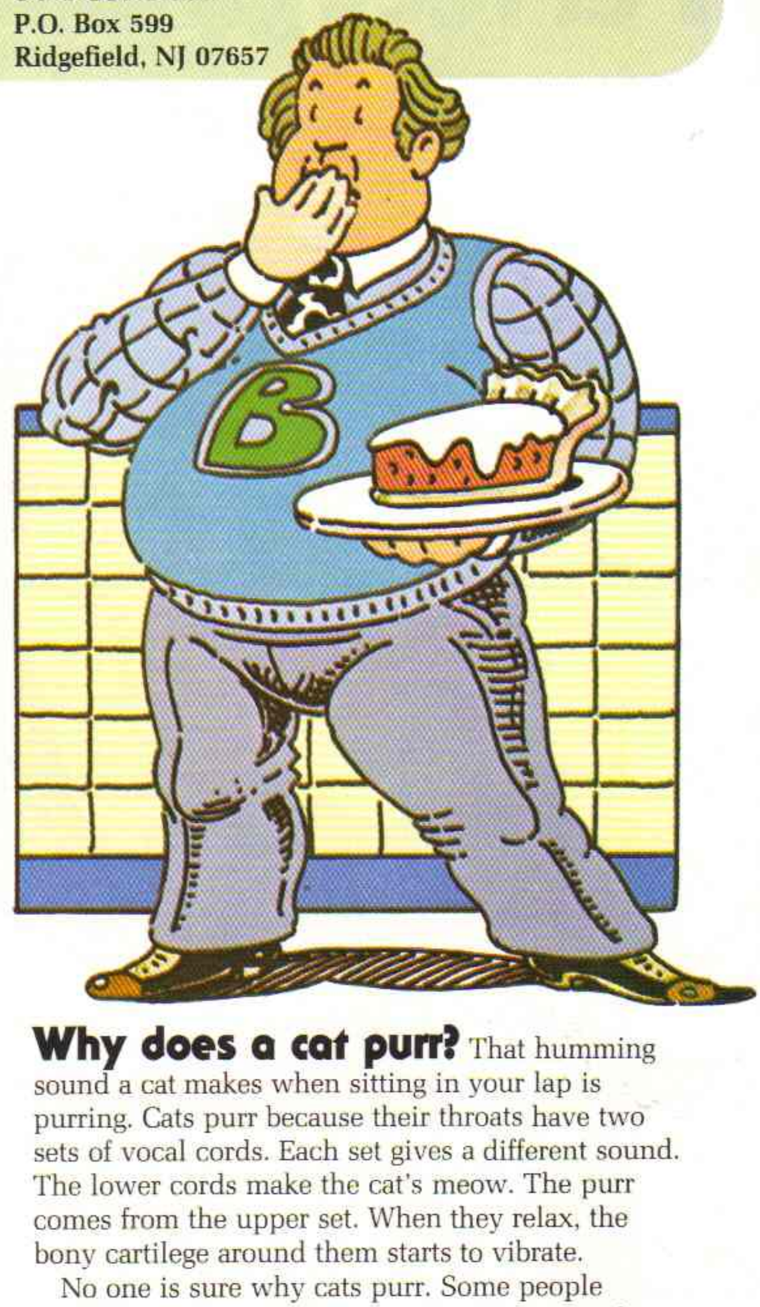
What causes a burp? Right in the middle of math class. U-r-r-p! All the kids giggled, but you couldn't help it. Everybody burps sometimes.

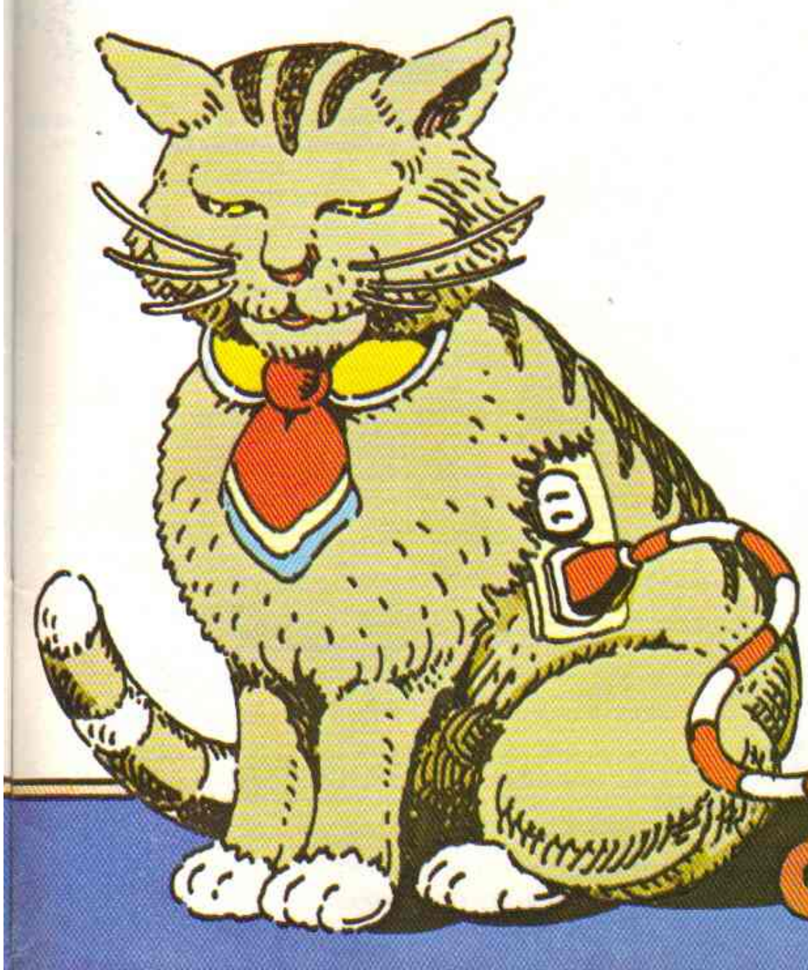
A burp gets its start when a person swallows air. Usually that happens when you eat or drink in a hurry. Sometimes people swallow air when they're nervous or excited. But why should air inside you cause a burp?

You take in air all the time. Usually it goes down the windpipe to your lungs, as it's supposed to do. But this time the air took the wrong path down your throat. It went down your food tube. In your stomach, the air formed a bubble.

Sometimes the bubble just disappears. Nobody knows exactly why. But other times, it comes right back up again. Traveling up the esophagus, the bubble comes out with a funny noise. It sounds like a balloon when you let the air out. Urp! Excuse me!

Question sent in by Celee Croxton, Mesa, AZ.





Why does a cat purr? That humming sound a cat makes when sitting in your lap is purring. Cats purr because their throats have two sets of vocal cords. Each set gives a different sound. The lower cords make the cat's meow. The purr comes from the upper set. When they relax, the bony cartilege around them starts to vibrate.

No one is sure why cats purr. Some people think it is a sign of contentment. But vets say that some cats purr even in pain. Others purr when they're asleep.

Kittens begin purring about a week after birth. But their mother purrs soon after they're born. This purr is a signal. It helps the kittens find their way to her. Although they can't see for about 10 days, the mother cat's purr keeps them from getting lost. She also purrs to let her kittens know it's time for dinner. When they come to eat, she stops. Isn't that pu-r-r-fect?

Question sent in by Ruth Martenson, East Barre, VT.

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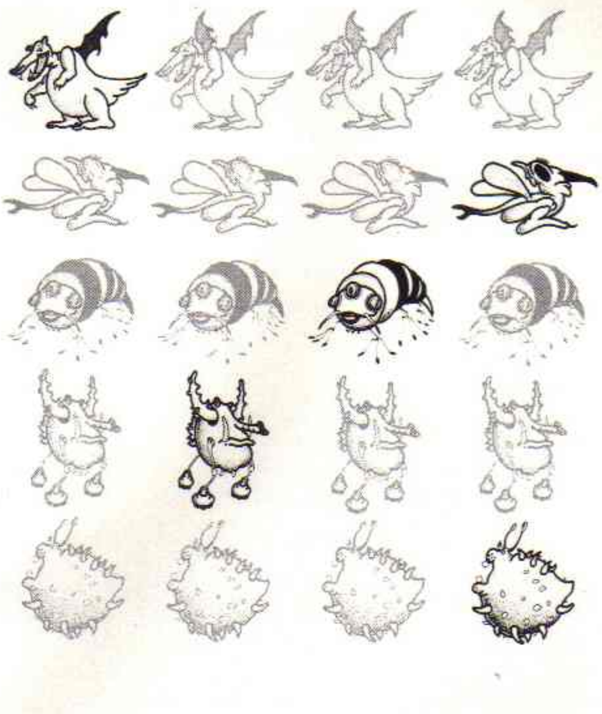
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200 Watt Street, P.O. Box 2922, Boulder, Co. 80322

Did It!

Sci-Fi Quiz
(pages 18-19)

1. elevator
2. photo copier
3. hair dryer
4. helicopter
5. toaster
6. pocket calculator
7. frisbee
8. cassette tape recorder

Creature Feature
(page 20)



Planet Maze
(page 21)



Credits

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OOPS!

IN OUR MAY 1980 ISSUE WE TOLD YOU THAT THE LENGTH OF JUPITER'S EQUATOR IS 88,730 MILES (142,766 KM). WELL, WE GOOFED! THAT'S JUPITER'S *DIAMETER*. A DIAMETER IS THE LENGTH OF AN IMAGINARY LINE PASSING THROUGH THE CENTER OF A PLANET OR OTHER SPHERE. JUPITER'S EQUATOR IS ACTUALLY 557,224 MILES (896,573 KM) LONG. THANKS TO JESSICA FROM ILLINOIS FOR CATCHING OUR MISTAKE.

Next Month!

Here's a sample of what you will find in the next issue of 3-2-1 CONTACT:

Dynamite Dinosaurs!
New discoveries are being made about these giant reptiles.

Amazing Astronauts!
Meet two people who are on their way to outer space.

Famous Failures!
We uncover eight great flops in the List of the Month

Plus Factoids, Earth Days, Timeline and Much More!

A VALUABLE STAMP COLLECTION FROM UNICEF

Stamp collecting is a wonderful hobby! Many, many people have found that it's not only interesting and fun, but valuable as well.

Did you know that within the USA only the US Government and the United Nations can issue stamps? As a matter of fact, there is only a certain number of United Nations stamps available each year, so they're really very special.

Now's your chance to have these official UNICEF First Day Covers. The First Day Cover of a stamp is issued on the first day that a stamp can be bought by the public, and it has a postmark which is for that day only. Imagine owning this new program, which includes stamps showing the flags of all of the member countries of the United Nations. This is the first time that UNICEF has ever issued First Day Cover collections, so there is no doubt that this group will be worth a great deal over the years.

Not only will you receive the First Day Cover stamps, which, in themselves, are like a small art collection, but you'll also get the miniature sheets containing the flags of 4 countries all put together on one page. The miniature sheets have been bought so quickly that the last one, in 1979, sold out the very first day it was issued! Today it's worth 5 times its original price.

Wondering what to keep your stamps in? There's a beautiful album that comes with your subscription at no extra cost. On every page you'll find a history of each nation, its flag and its coat of arms. You'll know all about its geography and its population, and a miniature map will show you where it is.

This UNICEF program is more than just a hobby; it's a marvelous way to help needy children around the world by providing food, medicine and books.

You can become part of this important project while you enjoy collecting your special stamps. Subscribe now.



Announcing the first official first day collection ever issued by UNICEF.



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CTW1

Skyfacts: The Moon

Each month SKYWATCH will bring you a close-up look at another planet or moon. Clip these pages and save them in a notebook. At the end of the year, you will have your own guide to the solar system.

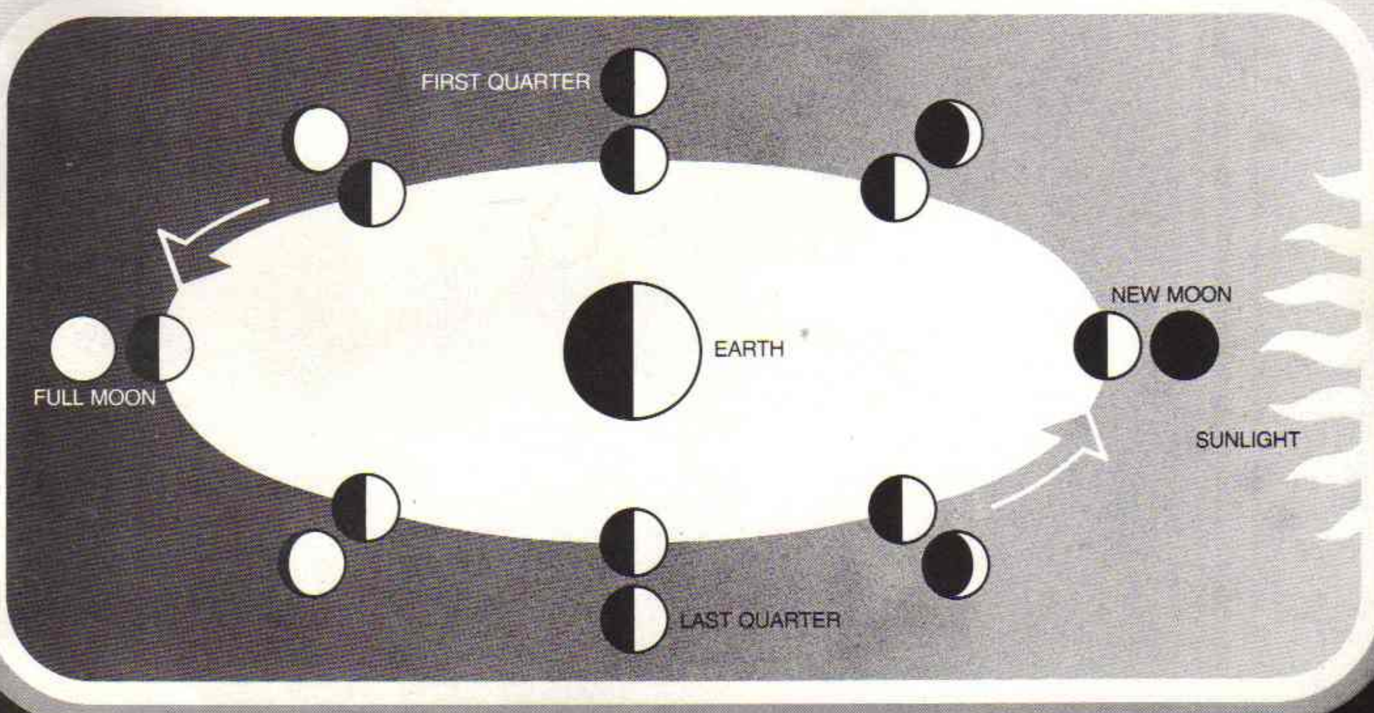
Phases As the moon travels around the earth, it goes through a month-long cycle of phases. At night, you sometimes see a full moon, sometimes a half, and at other times just a thin crescent.

Look at the diagram. You can see that half the moon is always lighted by the sun. But you can't always see all of the lighted side.

When the moon is between the earth and sun, its lighted half is turned away from you. On these nights you can't see the moon at all. This is *New Moon*. As it orbits, you see more of the moon's lighted half—*First Crescent*, *First Quarter*, and so on. At *Full Moon* all of its lighted side is turned toward earth. In the second half of the month, the part of the moon you see gets smaller. Finally it's New Moon. Then the cycle starts again.

Below: Half the moon is always lighted by the sun. The outer circles show you how much of the lighted side can be seen from earth as the moon moves around it.

- The moon orbits earth at an average speed of 2,300 miles per hour (3,700 km/hr).
- Clavius, the moon's largest crater, is about 140 miles (226 km) across. All of Delaware and Rhode Island could fit inside it.
- Gravity's force pressing on you helps determine your weight. The moon's gravity is 1/6 as strong as Earth's, so you'd weigh 1/6 your Earth weight.
- Because of weak gravity, you can jump four times higher on the moon than on Earth.
- The moon circles Earth about once every month. A day on the moon, the time it takes to make one turn on its axis, is also about one month long.
- Although the moon rotates, the same side of it is always turned toward Earth.
- During one lunar day, temperatures range from 270°F (105°C) at high sun to more than minus 200°F (–155°C) at night.





The moon is the first heavenly body to be visited by humans.

Focus on the Moon

The moon might be a nice place to visit, but you probably wouldn't want to live there.

First, you couldn't breathe, because there's no air. The moon's gravity is so weak it can't hold onto an atmosphere. Since air is needed to carry sound, the moon is a silent place, too. If someone screamed a few feet away, you wouldn't hear a thing. You would also notice that everything is deadly still. There's no wind—ever! And with no water, it never rains or snows. No clouds, no storms, no weather at all.

The moon's not much for scenery either. There are craters, ridges, rocks and dust as far as you can see. And everything is gray or dull brown.

The largest thing in the sky would be the earth—240,000 miles away. You'd be anxious to get back.

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